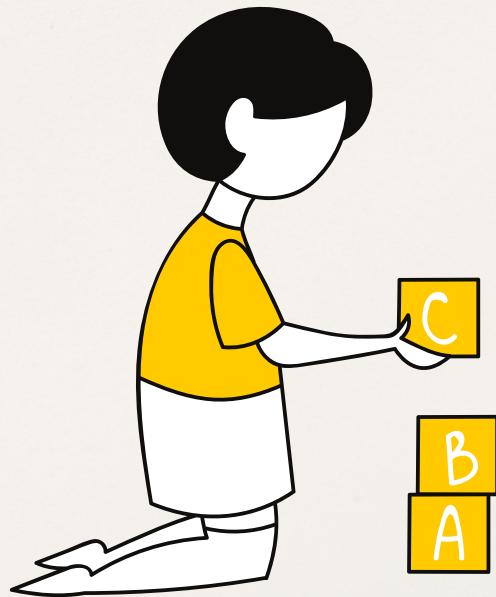


Study Notes & Key Learnings

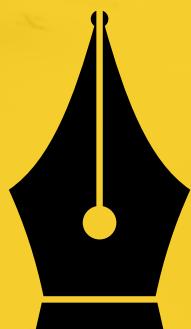
from
LEARNING ALL THE TIME
By John Holt



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STUDY NOTES & KEY LEARNINGS

FROM **LEARNING ALL THE TIME**

By John Holt

How are these notes compiled?

Chapter summaries, additional headings (and sub-headings), commentary (as needed), excerpts from other books and articles, footnotes, references, reflections, figures, and additional explanations have been added to the original text in order to elaborate it and make it easier for revising its contents. It is recommended to use these notes as a companion to the original book.

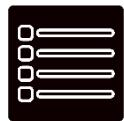
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MUHAMMAD NABEEL MUSHARRAF

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِيْمِ

In the name of Allah, the Most Merciful, The Always Merciful

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FOREWORD



This forward has been divided into two parts. Part 1 provides a brief overview of the life and mission of John Holt. Part 2 explains the way in which these notes have been structured.



PART 1

LIFE AND MISSION OF JOHN HOLT

JOHN HOLT (1923–1985), writer, educator, lecturer, and amateur musician, wrote ten books, including *How Children Fail*, *How Children Learn*, *Never Too Late*, and *Teach Your Own*. His work has been translated into fourteen languages.

The context in which his works can be understood

To understand the works of John Holt, it is important to understand what made him stop trusting the contemporary educational system in schools.

A critique of the discipline of psychology and child psychology:

Following are some of the reasons why certain theories in the field of psychology, especially those that deal with how children learn, can be doubted, if not rejected:

What is the discipline of Psychology all about? Psycho refers to ‘soul’ and ‘logy’ refers to ‘study’; hence the discipline was initially intended to facilitate the study of ourselves and our spirit. However, the irony of the matter is that the main researchers in the field at the moment are those

who do not believe in the spirit. One can infer a lot from this fact.

What are test objects for much of the experimentation in the field of psychology? Though the discipline is intended to help humans, the test subjects are mainly animals. During the study and theory formation, there is little dealing with the actual humans. During the courses on child psychology, students study theory after theory from ‘books’ rather than studying the actual children.

There can be two ways of studying kids: 1) To study theories and then apply them to kids, 2) To study the children directly and understand how they operate. Adopting the latter approach, John Holt challenged several theories that were (and many of them are) prevalent at the time.

One of the conceptions that he challenged was that children come to this world without any knowledge. The common perception is that the children are born with sin, problems, and a lack of knowledge; our job is to fix this state of theirs. Many believe that kids do not have intelligence; we have to give it to them. John challenged these incorrect assumptions and said that children are some of the most intelligent beings. They have “learning” within them. We just need to nurture it.

From the above, one can assess that the discipline of child psychology required to be relooked at in a completely new perceptive so that the shackles that the humans built for themselves could be broken. John Holt played a valuable role in this regard in the recent past.

A history of how capitalism captured the educational system

One of the fundamental questions that we should ask ourselves is that who is responsible for the tarbiyyah of our children? This role historically used to rest with family and the broader society. It continued this way till the industrial era came; the need of that era was considered by ‘thinkers’ to be the creation of a homogeneous workforce – a cohort that would not question the commands given to them and just obey what they were told to do. The trend started in Europe and then traveled across to other parts of the globe. The current schooling system is one of the outcomes of that.

It was designed for machines in mind rather than humans. The assembly line principle was applied. ‘Products’ of the same age were ‘processed together. As they used to pass through one process step, they were sent to the next. There was no flexibility in terms of what one wished to learn and at what time. Everyone had to follow one direction – the direction in which the assembly line conveyor moved them! The items that did not meet the ‘quality’ criteria or developed ‘defects’ were removed from the assembly line and put into waste. John strongly critiques this conception as can be seen in this book.

From the very early times, it was the job of religious scholars and academia to determine what is ‘right’ and what is ‘wrong’. The industrial revolution and its necessary product – Capitalism: the metaphysics of money - resulted in the reversal of roles. Capitalism and capitalistic institutions took the role of determining the criteria of morality. Educational institutions obeyed them well and started serving as means to implement their criteria of morality. The outcome is people who are intoxicated with a desire to earn more and spend more irrespective of how much harm they cause to people and the environment. There is accordingly a need to rethink how education and school can nurture morality and character.

A plethora of ‘learning disorders’:

From the 60s to 90s, any children who were not able to adjust themselves in the schooling system were labeled with certain ‘disorders’ and so on. This protected the schools from any extra (or better) effort and the whole blame of not being able to cope up was put on the children damaging their abilities and potential. John questioned this approach. He preached that these ‘disorders’ are only because of anxiety caused by the schools. When that governing factor is removed, no disorders continue to exist.

An overview of the life and books by John Holt

John Holt wrote 11 books. Many universities did not want to put his books in their libraries till a decade ago as they thought that his ideas were too dangerous for the ‘conventional’ system. For example, John asked parents

to unsubscribe from schools as the schools were not serving their intended purpose. However, the situation changed gradually and many of his ideas proved to be correct. Home-schooling is now an accepted way of educating children.

Some of John's books became all-time best-sellers on children's education. He wrote the following:

- *How children fail* (highly recommended for all parents and educators; Key theme: How do the kids learn and not learn? How do they learn to speak when no one systematically teaches them to do so? Had the 'school' taken the responsibility to teach 'speaking', half the world would have 'failed' to speak)
- *How children learn*
- *Instead of education*
- *The underperforming school*
- *Never too late* (Key theme: How John taught himself the skill of playing a musical instrument in old age)
- *Escape from childhood*
- *Freedom and beyond*
- *What do I do Monday?*
- *Learning all the time*
- *Teach your own* (Key theme: homeschooling)
- *A life worth living* (Key theme: Selected letters of John Holt; this book is considered to be highly important for all social sciences researchers)

John Holt influenced several other thinkers too. One of such very famous thinkers, who is a highly renowned academic with numerous awards and accomplishments, is Noam Chomsky. Inspiration for a lot of books by Noam came from the discussions and correspondence he had with John

Holt. One of such books is 'Media Control'.

Some key concepts from his works and other associated thoughts

What makes John Holt's work special and different from many other thinkers is that it is an internal critique of western thought (i.e. the critique of the philosophies of the West by the people of the west themselves). In this section, we have explained some of the elements of his thought and works.

On the purpose of education:

- 1) John highlighted that it is important to understand the difference between the 'Standard of living' and 'quality of life'. Standard of living is linked to ability and willingness to earn and to spend. Quality of life, on the other hand, deals with being happy, keeping others happy, and remaining happy.
- 2) It is vital to understand the connection between 'learning' and 'life'. They are connected. The education that separates the two is not the right education. The current system of education cuts us off from the family. Students are made to run after grades alone without bothering about how their relationships, sleep, and health copes up with their routines.
- 3) He, through his works, invited people to ponder on who is entitled to be called 'educated'. He questioned: How can a person oblivious to his purpose in life be considered educated?
- 4) What is the role that the schools can play? John explained that in three sentences. The schools should enable the kids to openly say: 'I don't know'; 'I am sorry'; and 'I may be wrong'. These three sentences, if one looks carefully, relate to ethics, morality, and self-awareness.

On the process or method of education:

- 1) The current educational system is a means of unnecessary stress for children. Earlier, only the aged people used to get 'stressed out'. But

now it has started to happen to younger people too. The kids of age 6 too show the symptoms of stress. These are the fruits of our educational system which makes kids do what is against their nature and God-gifted characteristics. How can such young children be made to sit in ‘exams’ and do things that no intelligent person would like to do? This is not the right approach. The children prefer to do actual activities and use the actual tools that adults use in their lives more than they prefer to use the play versions we give them as toys or the “learning activities” we force them to do.

- 2) Learning is not a name for teaching; it is the activity of the learners. Accordingly, learners should be given ‘learning opportunities’. Teaching should not be forced upon them. If the child is not interested in something, you cannot make him interested by force. Parents and teachers can show their own interest in a thing and work on it. The interest will ultimately infuse in children too. John provides some good examples of this in the current book (e.g. the Suzuki method of teaching music).
- 3) Parents and teachers should understand the uniqueness of children and value that. Everyone is different; we should not try to make everyone the same. Children are blessed with diverse skills. Individuality and the ability to choose what to study and with whom was a hallmark of the golden age of Muslims. The present educational system has stolen that. John rightly questions that and brings it into focus.
- 4) One of the problems in the approach of parents and teachers is that they don’t give children their due freedom. Children should be allowed to make decisions about their learning. If their decision-making ability is not nurtured, they would not be able to make good decisions for themselves when the time comes.
- 5) There are numerous reasons for parents and teachers to not ‘correct’ or ‘fix’ every mistake of the children. Children can perceive this as rudeness which can shatter their learning abilities. Correcting does not recognize the child’s intellectual accomplishments and does not

always help a child learn better. Many times, it is better for a child to figure out something on his own than to be told. John repeatedly points out that children learn better when they aren't "worrying about learning."

- 6) John questioned the notion of rewards in schools too. If we make people do good things based on worldly motives, it only results in polluted intentions. That children need courtesy, politeness, and above all focused attention more than they need praise and stars on their notebooks. As Muslims or adherents of other divine religions, however, we should understand that the reward that God gives is not the same as this. It is in the realm of 'unseen'. It is based on trust in Him. It is not handed over to us in its physical form as soon as we perform a good deed. Whereas, the worldly reward given to us after a positive outcome links the effort for a positive outcome with the reward. If there is no reward, the effort is not there.

On homeschooling

We should not follow the Herd mentality. The crowd often follows what the herd is doing even if it is something stupid. This is what we do for our children in career selection as well as their education. Phonics, for example, is one of the many aspects in which this mentality is blindly followed. It is a means of making our kids look like stupids and make sounds which no intelligent person can be seen making. Another outcome of herd mentality is that we think that the only place where children can get education and learning is school. One of John's key movements against this mentality was to 'Un-School' the children. The term unschooling later got rebranded by people as "home-schooling" as they could not grasp the concept that there could be life without the 'schools'. John practically questioned all institutions produced by capitalism. He believed that parents can provide a better education than schools through alternate means. It is to be understood, however, that trying to "teach" kids at home without an understanding of the correct method of unschooling can be more dangerous than sending them to schools.

PART 2

AN OVERVIEW OF THE CURRENT WORK

The current work is a collection of some explanatory notes about the book 'Learning all the time' (which we have sometimes called in these notes as LATT). The current work intends to serve as a companion to the original book. It is mainly for the benefit of the author of these notes himself; though others might find some of it useful for them too.

About Learning All the Time:

LATT is a *demonstration* that children, without being coerced or manipulated, or being put in exotic, specially prepared environments, or having their thinking planned and ordered for them, can, will, and do pick up from the world around them important information about what we call the Basics. It will also demonstrate that "ordinary" people, without special training and often without large amounts of schooling themselves, can give their children whatever slight assistance may be needed to help them in their exploration of the world, and that to do this task requires no more than a little tact, patience, attention, and readily available information. Chapter topics include reading and writing, numbers, children's natural research methods, music, parental example, and helping children explore. As in his other books, Holt includes lots of personal stories and examples from children he knows. John Holt's wit, his gentle wisdom, and his infectious love of little children bring joy to parents and teachers alike. These stories help to model his ideas so we can see what they look like in practice.

LATT is not a book about "How to Help Your Child Succeed in School." This is not a dry, lengthy, clinical textbook on the history and development of child education, over-flowing with theories. This is an explanation of how children essentially teach themselves. It praises the curiosity, creativity, and ingenuity of children for learning about the world around them. Children learn from anything and everything they see. It is a book about children learning! Learning in this context means making more sense of the world around them and being able to do more

things in it. For human beings, John reminds us, learning is as natural as breathing. Success in school means remembering the answers to teachers' questions, getting clever about guessing what questions they will ask, and about how to fool them when you don't know the answers. John explains: "Years ago, even before my first book came out, I was for a while tutoring an eighth-grader, who was having some troubles in school. One day she asked me, with great seriousness, "How do you learn about history?" Taking her question as seriously as she meant it, I said, "I think you may be asking me two questions: one, how to learn more about history, and two, how do I get better grades in history class in school? The first thing to understand is that these are completely different and separate activities, having almost nothing to do, with each other. If you want to learn more about how to find out about what things were like in the past, I can give you some hints about that. And if you want to find out how to get better grades in your History class, I can give you some hints about that. But they will not be the same hints." She understood and accepted this, and asked me for both kinds of hints, which I gave her. In this book, I will, for the most part, be discussing the first of these two questions: what sorts of things might we do to make various aspects of the world more accessible, interesting, and transparent to children."

John Holt died in September of 1985 before he could finish this book. Since he had outlined so clearly what the book was to cover and had written so much of it, in the draft, in the magazine, in letters, or elsewhere, the compilers were able to assemble the book according to his design. In a few instances, when articles he had written earlier spoke directly to the themes he had laid out, these have been woven in with appropriate chapters. The editorial assistance required in the compilation of the book was provided by close associates of John Holt.

Criticism of the book:

Though this book is highly praised by many, many others consider it to be lacking in certain aspects. For example, one of the educators mentions: "There is so much fantastic research on education and learning that is ignored by most teachers and schools, it was unfortunate that this book

did not take advantage of that and was anecdote rather than data-driven. Many areas could have used a bit more research or might have been examined in more depth". Another parent recounts: "His extreme hands-off approach also does not fit with what I remember from my own childhood. Yes, more stellar teachers would have been able to draw out more from me over the years and nurture my interests more. But summer book-reading contests and the competition of grades and the imposition of reading (such as *Tuck Everlasting*) that I would not have found without the school also accelerated my learning." As explained in this comment, lack of research-based evidence bothered some readers, but for others, it was a part of their good experience with the book as indicated in the following comment from a teacher: "There wasn't much evidence cited to prove his theories, but that didn't bother me (since I wasn't expecting to learn facts). Rather I was looking for insight into the whole *unschooling* movement, that (at least in my understanding) spawned from the introduction of Holt's books and ideas." In summary, we can say that this book is an excellent resource for parents and teachers; however, they can also openly look for other pieces of information that can help them become better at what they do in terms of nurturing and nourishment of the spiritual, physical, and mental abilities of the children. We should always be in a quest to continuously improve and grow.

About the study notes:

These notes have been prepared with the following in mind:

Additional headings: This book is an extremely important book for parents and teachers. They should not just read it once. They should keep referring back to it to refresh their concepts and check if their conceptions are still correct. However, it is found, through experience, that finding a particular topic, concept, or example in the book can sometimes become difficult if one comes back to it after some time. As humans, we can forget things. To facilitate easy identification of where a piece of information is, numerous sub-headings can be added. It can be beneficial from a "micro-learning" perspective too and people can jump straight to the portion they wish to revise.

Chapter summaries: For many learners, it becomes much easier to learn the concepts when the overall picture is shown to them first. They can then comfortably see how various pieces interact with each other and form the whole. With this perspective in mind, a summary of each chapter in the book has been provided. This can serve as a good quick overview for refreshing the contents of the whole chapter.

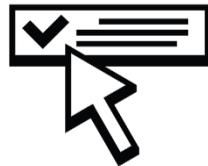
Explanatory notes: In this book, John has mentioned several other authors and books. For a reader who has not seen those works before, it can sometimes become difficult to get an idea about what John is pointing towards. To assist readers in overcoming this difficulty, some explanatory notes (**yellow boxes**) have been added. They provide a description and explanation of certain concepts that some might find as needing further expansion. They also provide an introduction to the works and the authors mentioned by John in the text, excerpts from other books, and so on. I have also added my personal reflections in the explanatory notes as I consider them beneficial for myself when revising the contents. They can also help other readers and provide them with a direction of thought if they are looking for one.

Footnotes: The concepts that could have distracted the readers if explained in the yellow boxes and break the continuity of their thought, have been elaborated in the footnotes. This includes the meaning of some difficult words, explanation of some related concepts, references, and so on.

Figures: Several figures and pictures have been added to elaborate on the concepts covered in the book.

It is clarified again that these notes are only to be used as a companion to the original book and not as its replacement. The additional details, reflections, and explanations included in these notes can be distracting for some readers and disrupt their flow and attention. It is, therefore, requested that these notes should be used when reading the original book or its chapters the second time.

SELECTED STATEMENTS FROM THE BOOK AND REFLECTION ON THEM



The following is a collection of 15 statements from the book (at least two from each chapter) that I found to be most inspiring. They are accompanied by some of my reflections about the concept discussed in them.

Chapter 1: Reading and Writing

<i>Statement from the book</i>	<i>Reflection</i>
<p><i>Statement 1 (From the section 'Thirty Hours')</i></p> <p>Thirty hours. One school week. That is the true size of the task.</p>	<p>This is the punch line regarding acquiring the reading skill. In just 30 hours, by following various strategies described in this and other books, one can learn to read (and this is applicable for children as well as adults). However, when we look at our schools, a considerable time, effort, and energy is spent on teaching children how to read and yet many students don't get to do it properly. It emphasizes the importance of following the right techniques and allowing children to have access to books that can trigger their interest. A good library at</p>

home and a good library at school can be great friends of children in the process of learning to read. Exposure to a variety of books can do wonders for kids. My own life turned around when I got exposed to an excellent library. Taking them to libraries is one of the best things we can do as parents. If we couple it with unconditional love and the right environment, we perfect the recipe the reading readiness.

***Statement 2 (From the section
'How not to learn to read')***

Leon, a young black man of about seventeen ... was a student in an Upward Bound summer program. He was at the absolute bottom of all his regular school classes, tested, judged, and officially labeled as being almost illiterate. At the meeting I went to, the students - some black, some white, all poor - had been invited to talk about their summer school and what they could remember of their own school experiences and how they felt about them. Until quite late in the evening Leon didn't speak. When he did, he

This story shows that a child was termed as illiterate as he was unable to read what was given to him to read by others. However, when he found something that he really connected with and really wanted to know, he was able to teach himself to read by himself without any need for teaching. This is what happens when we have a strong interest in something. It can make us learn much quickly and effectively. What we can learn from this as parents and teachers is to make those books available to children in which they have an interest. For example, my child

didn't say much. But what he said I will never forget. He stood up, holding before him a paperback copy of Dr. Martin Luther King's book *Why We Can't Wait*, which he had read or mostly read, during that summer session. He turned from one to another of the adults, holding the book before each of us and shaking it for emphasis, and, in a voice trembling with anger, said several times at the top of his lungs, "Why didn't anyone ever tell me about this book?"

has a very strong interest in Afro-American history. When he finds a book on this topic, he doesn't really need to be asked to read it. He reads it immediately and for long durations in one sitting out of his own interest.

Statement 3 (From the section on 'Sensible Phonics')

Another very common school mistake is to ask children to learn and memorize which letters are vowels and which are consonants. Schools usually do this by trying to teach the children some definitions of "vowel" and "consonant." These definitions are almost always inconsistent and self-contradictory.

This points out a very important aspect. In our schools and madaris, we have too much focus on 'definition'. Especially in language teaching, we often make learning really difficult by presenting simple things as overly complex concepts. For example, when Arabic is taught, quite often the teachers tell students that there are 32 ways to make a plural for a word. Many poor students have to memorize those 32 ways. This, however, is not how languages are to be learned. When we learned our mother tongue, no

	one taught us how many ways were there to make plural for words in that language. We learned it through exposure. The same can be adopted in language teaching too. The concepts can be presented in simple-to-understand ways.
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Chapter 2: At Home with Numbers

<i>Statement from the book</i>	<i>Reflection</i>
<p>Statement 4 (From the section, 'None of this is necessary')</p> <p>... Our minds are much more powerful when discovering than memorizing, not least of all because discovering is more fun.</p>	If our focus is more on enabling kids to discover the knowledge rather than making them memorize the facts (such as tables), the kids will learn much more. When they work out something by themselves, they will own it as their own discovery. When they are 'made to' memorize something, they will remember it as a thing forced upon them for which they had not worked out in their brain the 'why' and 'how' aspects. As parents and teachers, we should, therefore, allow the process of discovery and facilitate that through various games and natural observations. If such games are linked to what kids are more

	interested in, they will be more powerful.
<p><i>Statement 5 (From the section 'Solving problems')</i></p> <p>The pleasure of solving a problem does not always come all at one sitting, or from one day to the next as in homework problems. I once worked on a problem for over twenty years.</p>	<p>As parents and teachers, we should avoid creating a sense of urgency for children when they are trying to solve a problem. It often happens with parents that when they are 'teaching' something to their kids at home (e.g. the maths problems given from them as homework), they explain it to them once or a few times and then start getting angry when kids don't get it. This is not the right way. There is no element of self-discovery in this. There is no freedom and no leisure. We should remain calm and make learning interesting for them (rather than being forced). It is best done when kids are involved in real-life situations such as being involved in managing the home finance, or other tasks that their parents are involved in.</p>

Chapter 3: Young Children as Research Scientists

<i>Statement from the book</i>	<i>Reflection</i>
<i>Statement 6 (From the section,</i>	This is the process, which is exactly the same as the scientific

'Puzzles')

Children observe, they wonder, they speculate, and they ask themselves questions. They think up possible answers, they make theories, they hypothesize, and then they test theories by asking questions or by further observations or experiments or reading. Then they modify the theories as needed, or reject them, and the process continues... If we attempt to control, manipulate, or divert this process, we disturb it. If we continue this long enough, the process stops. The independent scientist in the child disappears.

method, through which children learn. The first thing they do is observe. If there is a lot out there to observe, they will observe a lot. That is why it is important to give a variety of exposures to children. Travelling can be an excellent way of doing so, among many other things that parents can easily do. After observation, they wonder, speculate, and ask themselves questions. This is a highly critical phase and the outcome of this governs how the process continues. If no questions are raised, the kid will not proceed further. We should therefore consider questions to be a blessing of Allah swt and encourage them in kids whenever we come to know of them (rather than being irritated by them). Coming up with questions equates to knowing half of the knowledge. Many great thinkers used to trigger curiosity and questions in the minds of their pupils by only asking questions only (rather than giving them the answers). The students used to search for the answers by themselves and learn a lot of knowledge in their

	<p>quest to do so.</p> <p>Coming back to young children, to answer their questions, they come up with certain theories and hypotheses regarding why certain things happen and why certain phenomena occur. Then they seek clarification about them. That is when they invite knowledge to be given to them. Forcing teaching before that can impede learning. The focus before this point should be on creating exposures and questions. Many such processes can run in parallel and the kid can be in different stages of each parallel quest. We should not disrupt this quest and process of discovery by forcing things on children, breaking their observation process, and asking them to follow some robotic routine. We should rather encourage the process. If we keep putting hurdles in the way of this process, it will ultimately vanish and our child would also become a part of the crowd.</p>
<p>Statement 7 (<i>From the section, 'Making our own connections'</i>)</p> <p>Real learning is a process of</p>	<p>These are the four conditions that we should strive to make available as parents and teachers. The children should</p>

discovery, and if we want it to happen, we must create the sets of conditions in which discoveries are made. We know what these are. They include i) time, ii) leisure, iii) freedom, and iv) lack of pressure.

have time to observe and explore things. It should not be made time-bound. If a child has a particular type of intelligence, it does not mean that he or she would be able to do things quickly if they relate to that particular type of intelligence. Learning requires time and this is what we should make available rather than being in the urgency syndrome all the time. The second condition is the leisure or comfortable settings. The things should not be forced upon children. Then comes freedom. They should be allowed to choose when to explore certain things, how, and to what extent. Their natural processes should not be interrupted. All this should be done without pressure. The hormones that get generated in the brain might help with a short-term response but not with long-term learning.

Statement 8 (From the section, 'Making our own connections')

But what often happens to kids in school is that they are required to repeat, as sense, what makes no sense to them, to

Childs should be allowed to make sense of things themselves. They should be allowed to establish connections between different things and understand 'why'. This

the point where they give up trying to reconcile what people say about the world with what they really feel about it.

statement refers to what happens in schools – something that is totally contradictory to the above-mentioned process. Things would start to make sense to kids after the kid has made the required connections about it in his or her brain. If the kid is asked to repeat or reproduce something about which the connection is not yet established in his brain, the kids give up the process of establishing connections. They just start following what is told to them. They stop questioning and their creativity and curiosity receive a serious blow. Because of this, they become a part of the herd and follow the crowd – irrespective of which direction they are heading towards.

Chapter 4: Loving Music

<i>Statement from the book</i>	<i>Reflection</i>
<p>Statement 9 (From the section, 'Starting Early')</p> <p>The assumption that the steeper the learning curve the higher it will go is also unfounded. If we</p>	<p>The brightest of performers do not necessarily show signs of brightness from an early age. The success and aptitude depend on several factors including when the exposure</p>

did things a little differently, we might find out that people whose learning curves were much slower might later on go up just as high or higher.

became possible, when the interest sparked, when the right conditions to learn became available, and so on. Therefore, it is incorrect to assume that the curves that start the steepest go the highest. It is very much possible that a curve is flat in the beginning and then it becomes so steep that it leaves behind the curves that started steep. Also, it is not always desired to have a steep curve in everything. A child may be better in one thing than the other depending on the type of intelligence he or she is blessed with.

Statement 10 (*From the section on Suzuki method*)

He [Suzuki] set out to devise a way of learning violin that would be as close as possible to the method children use to learn their own language. He realized that children had to hear a lot of other people's speech before they could make their own, and that they did a lot of speaking before they did any reading or writing. He also realized that children want very much to do what they see the adults around them doing. From these sound

This statement teaches us a lot of important things about how a skill can be learned. One of the things is that if we wish for children to learn something, the learning environment should be as close to the natural way in which children learn as possible. In the given example, Suzuki organized for the learning of violin to happen on the same line on which the kids learn to speak - i.e. listening to a lot of adults speak before they start to speak themselves; then saying simple words at the beginning

insights, he developed his method.	rather than trying to say whole sentences, and then gradually learning to say and express more complex things. Another important learning from this statement is that the children wish to get involved in real-world things. Rather than the 'kids' stuff, they are interested in what adults do and what they talk about. That is why the parents must engage in the learning process with children and involve them in real-world examples and situations.
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Chapter 5: What Parents Can Do

<i>Statement from the book</i>	<i>Reflection</i>
<p>Statement 11 (From the section, 'Uninvited teaching')</p> <p>Ninety-nine percent of the time, teaching that has not been asked for will not result in learning but will impede learning.</p>	<p>This is a very important point for parents and 'teachers' to understand.</p> <p>Uninvited teaching, like how it happens in most schools, impedes learning. What we can do instead is to provide such exposures to children that raise questions in their minds. When a question is raised, or in other words, a gap is created in the mind, the child would himself ask for information then and</p>

	would be able to absorb what is told in a much better way.
<p><i>Statement 12 (From the section, 'The Power of example')</i></p> <p>Adults must use the skills they have where children can see them. In the unlikely event that they have no skills to speak of, they should learn some, and let the children see them learning, even if only as simple a thing as touch typing. They should invite children to join them in using these skills. In this way, children can be slowly drawn, at higher and higher levels of energy, commitment, and skill, into more and more serious and worthwhile adult activities.</p>	<p>This can be an excellent way of teaching. It also links to the statement and reflection above in which the importance of creating curiosity in the minds of children is discussed. When adults practice a skill in front of children, they become interested in it. For example, when the mother is cooking (and if children have not got addicted to the devices as yet) become interested to spend time with her and participate in the process of cooking. Similarly, if the father is doing some repair work at home (again if the kids are not engrossed in their devices) become interested to see what is happening. This phenomenon was put to excellent use by the Lil Ny Skool where there were no formal 'teachers'. Rather, some experts used to be busy doing what they were good at. Children used to observe them, ask questions, keep an update of how far the project reached, and so on - without being asked to do this. In the process, they used to learn</p>

	a lot. A similar system can also be implemented in our schools – especially for the children of younger age.
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Chapter 6: The Nature of Learning

<i>Statement from the book</i>	<i>Reflection</i>
<p>Statement 13 (<i>From the section on 3 metaphors about education; the excerpt below is from the description of metaphor 1)</i></p> <p>..Educators cling to the notion that teaching produces learning, and therefore, the more taught, the more learned... If students don't know enough, we insist, it is because we didn't start squirting soon enough (start them at four), or didn't squirt the right stuff or enough of it (toughen up the curriculum).</p>	<p>This explains the dilemma of our educational system. Over the years, this notion has got developed that just like how bottles can't be filled by themselves in a bottling plant, learners can't learn themselves; accordingly, they have to be put through 'curriculum' and 'teaching'. This limits the amount of exposure available to children. What they can learn much quickly through their natural curiosity in the presence of a suitable learning environment and freedom often takes much longer to be 'taught' in school. For example, the reading skill which children can get taught in 30 hours takes schools many years to deliver and with much pain.</p> <p>This is the mistake that we do in religious schools too. When we</p>

	<p>think that they are not coming out of them as good Muslims, we increase the amount of Islamic studies curriculum rather than questioning how things are taught. Maulana Maududi has addressed this issue beautifully in the book called '<i>Taleemat</i>'.</p>
<p>Statement 14 (From the section 'Learning is making sense of things')</p> <p>A child just feels a gap in his mind, like a missing piece in a jigsaw puzzle. But when through his experiences, one way or another, along comes the piece of information that fits that gap, it's pulled in there as if by a magnet.</p>	<p>This highlights the importance of curiosity. If you are curiously looking for a piece of information, it will really stick in your mind when you get it. As parents and teachers, one of the things we can do to acquire benefit from this phenomenon of nature is to facilitate the rise of questions in the mind of children. It could be through conversations with them, or doing things in front of them (like in the Suzuki method of music education), or making such objects available around the children that prompt them to understand how they work and why.</p>
<p>Statement 15 (From the section: Every Waking Hour)</p> <p>The one thing we can be sure of</p>	<p>This statement points out the importance of natural curiosity in children. This is something inbuilt in them. Allah swt has</p>

or surest of is that children have a passionate desire to understand as much of the world as they can, even what they cannot see and touch, and as far as possible to acquire some kind of skill, competence, and control in it and over it.

programmed them in this way that they passionately try to know the world and acquire competence. One can say that this urge would not get fulfilled unless children are engaged with real-world situations and objects. If we can facilitate that, inshaAllah our kids will become good and mature decision-makers in their life as they grow. These were the sort of experiences that Lil Ny Skoll (an innovative school in Denmark, as explained in this book) tried to provide.

CHAPTER ONE

1. READING AND WRITING



The world of books was first opened to Anna, she came to be a citizen of it, then for the first time she clutched a book in her hand and thought "This book is mine."

This is one of the biggest chapters in the book. Some of the key themes in this chapter are as follows:

In order to facilitate children, learn to read effectively, they should be allowed a personal space with a personal connection. They should be able to lean on an adult that they trust and practice reading (without being forced to do so, without being shamed, without being made fun of, and without being shown anger and disgust. The example of a little school in Denmark can be considered in this regard where there were no formal reading programs and only the above arrangement was made. The children there could learn to read in only 30 hours. There are numerous other examples too where a language skill could be acquired in only 30 hours.

In the chapter, John also presents the example of Chris, a 5-year-old who learned about letters from the shapes of his toys. The child was interested in what his father does and that made him play with toys related to transport. From that story, we learn that sometimes it is ok to point out certain things to kids to spark an initial interest (like how John pointed out the U being formed from the tracks) and then the children can take it on from there and

explore.

After this, John has explained several cases studies and tips about what works and what doesn't work for children in the acquisition of the ability to learn. One of the recommended books for children to self-study is 'Let's read' which presents groups of words with similar sounds grouped together. Children can explore this on their own and learn a lot from it. In addition to providing similar books for children to read, parents and teachers should also ensure that children get exposed to a lot of print. This could be in the form of newspapers, books, and so on. The schools can also put real-world things on walls – such as real letters, real bank statements, real maps, real political posters, and so on. These real-world things will acquire greater interest from children as they see adults dealing with these things and have a natural curiosity for them. They do not find this level of curiosity with the 'children' books that have a lot of pictures and very few words. Teaching phonics is not necessary to develop reading skills. If children learn about the letters, they can work out the phonics themselves without doing crazy things that normally happen in the class.

To establish this argument, John gave the example of Paul, who learned to communicate through writing at an early age. He re-invented the wheel (in an excellent manner). He worked out the sounds of letters and then put them in order to the best of his ability to convey the sentences. Initially, this was without any spaces between the words and without the vowels. Then he improved on it through the process of self-correction and observation. This sort of opportunity can be a great learning journey for children which they can replicate in several other situations in their lives. Children are following a scientific method. Let them discover it rather than testing them and ruining their experiment.

With regards, to reading, it is to be understood that children learn to write first and then to read and not the other way. Moreover,

they are interested to read what they want to read rather than reading what they are asked to read. We should enable them to fearlessly decide what they wish to read and write. If they do mistakes in this process, that is not a bad thing. Mistakes are a great source of learning and they should be perceived in this manner.

Another mistake that happens in many schools is giving too much emphasis on cursive writing. It is believed that it enhanced the speed. However, John explained in detail that this is not the case and experiments oppose this assumption. Accordingly, writing should be made an enjoyable experience for children rather than an unnecessary burden.

With regards to comprehension of words, John points out that the understanding of the meaning of words comes from the context in which they are used. One does not need to constantly refer back to the dictionaries. Dictionaries are themselves a collection of how a word is used in different contexts. Preserving interest is more important than understanding the meaning of the words (which would ultimately come in any case once one sees their use in many contexts). The whole experience should be made fun-filled and not pain-struck.

One of the useful classroom techniques is chorus reading in which the teacher writes certain words on the blackboard, puts the pointer on them and children read along, together, as the pointer moves. The children who know the word read louder and others learn in the process. No disrespect and shaming are involved. Learning to read through the songs that children already knew is also a good idea. The text of the song can be shown on the blackboard and the children sing along as each word appears. Reading stories to kids with a finger on the word being read is an excellent technique. While seeing the words being pointed out for some time, children learn those words without being deliberately

taught.

One of the reasons how we prohibit language learning in children is that we bombard them with vocabulary to 'memorize' and throw too many definitions upon them. This is not required. We also are found to be too keen to correct any mistakes. This is often done disrespectfully (as John points out about how the big bird in Sesame Street was disrespectfully corrected when he spelled something incorrectly).

With regards to spelling, it is to be noted that extra 'drills' do not bring much improvement in them. They improve when one types.

1.1 READING AND TRUST

1.1.1 *Importance of physical connection*

Once I visited a family whose youngest child, then about five, I had not seen in several years. After sizing me up for a while from a distance, and deciding that I seemed to be OK she made friends, and soon asked me if I would "help her read." Not quite knowing what she meant, I said I would.

She got her book, Dr. Seuss's *Hop on Pop*, led me to a sofa, and when I was seated, climbed up, snuggled against me, and began slowly to read out loud. Apparently, the first thing she had to do before the work could begin, was to get in **cozy physical contact** with me.

In *The Lives of Children*, describing his work with twelve-year-old Jose, the tough street kid, George Dennison makes the same point. He could work with Jose only when the two of them were alone in a locked room. Of these meetings Dennison writes:

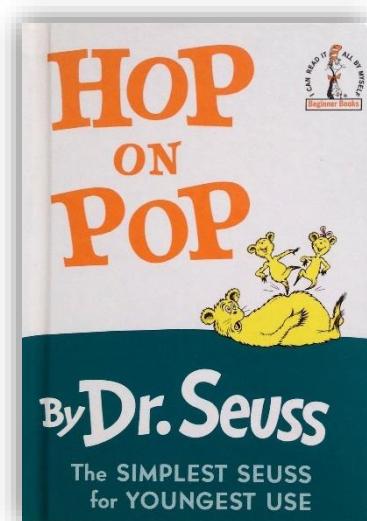


Figure 1: Title of the book Hop on Pop

And so our base of operations was our own relationship; and since Jose early came to trust me, I was able to do something which, simple as it may sound, was of the utmost importance: I made the real, the deeper base of our relationship a matter of physical contact. I could put my arm around his shoulders, or hold his arm, or sit close to him so that our bodies touched... The importance of this contact to a child experiencing problems with reading can hardly be overestimated.

I have to add here that the **trusting had to come before the touching**. To touch or hold a child who has not yet decided to trust you will only make that child far more nervous.

It is a very important point. One should only get to close proximity of children if they feel comfortable. Their trust has to be won first. As parents, we should only allow our children to be in the proximity of those people who are pious and trustworthy. We should specifically look for such people and avoid all that can be a risk or threat to the safety of our children.

1.1.2 Importance of providing a private space

In any case, whether you are a "gifted" five-year-old or a terrified, illiterate twelve-year-old, trying to read something new is a dangerous adventure. You may make mistakes or fail, and so feel disappointment or shame or anger, or disgust. Just in order to get started on this adventure, most people need as much-comfort, reassurance, and security as they can find. The typical classroom, with other children ready to point out, correct, and even laugh at every mistake, and the teacher all too often (wittingly or unwittingly) helping and urging them to do this, is the worst possible place for a child to begin.

This is a fundamental point that many of us miss – at schools as well as homes. We do not provide that private, secure, and relaxed environment where they can concentrate and enjoy what they read. The settings (our relationship with us) that we provide them constantly make them focus on others (or others focus on

them) which can restrict their ability to acquire a good reading ability. No learning can happen if the learner finds himself disrespected and humiliated.

1.1.3 An alternate environment to foster interest in reading

At the Ny Lilleskole (New Little School), near Copenhagen, which I described in *Instead of Education*, there is no formal reading program at all - no classes, no reading groups, no instruction, no testing, nothing. Children (like adults) read if, and when, and what, and with whom, and as much as they want to. But all the children know — it is not announced, just one of those things you find out by being in the school — that anytime they want, they can go to Rasmus Hansen, a tall, deep-voiced, slow-speaking teacher (for many years the headteacher of the school), and say, "Will you read with me?" and he will say, "Yes." The child picks something to read, goes with Rasmus to a Little nook, not a locked room but a cozy and private place sits down right beside him, and begins to read aloud. Rasmus does almost nothing. From time to time he says softly "Ja Ja," implying "That's right, keep going." Unless he suspects the child may be getting into a panic, he almost never points out or corrects a mistake. If asked for a word, he simply says what it is. After a while, usually about twenty minutes or so, the child stops, closes the book gets up, and goes off to do something else.

One could hardly call this teaching. Yet, as it happens Rasmus was trained as a reading teacher. He told me that it had taken him many years to stop doing, one at a time, all the many things he had been trained to do, and finally to learn that this tiny amount of moral support and help was all that children needed of him and that anything more was of no help at all.

1.2 THIRTY HOURS

1.2.1 Time required by kids to learn to read

I asked Rasmus how much of this "help" children seemed to need before they felt ready to explore reading on their own. He said that from his

records of these reading sessions, he had found that the longest amount of time any of the children spent reading with him was about thirty hours, usually in sessions of twenty minutes to a half-hour, spread out over a few months. But, he added, many children spent much less time than that with him, and many others never read with him at all. I should add that almost all of the children went from the Ny Lillee Skole to the gymnasium, a high school far more difficult and demanding than all but a few secondary schools in the U.S. However, and whenever the children may have learned it, they were all good readers.

1.2.2 Time required by adults to learn to read

Thirty hours. I had met that figure before. Years earlier, I had served for a few weeks as a consultant to a reading program for adult illiterates in Cleveland, Ohio. Most of the students were from thirty to fifty years old; most were poor; about half were black, half white; most had moved to Cleveland either from Appalachia or the Deep South. There were three sessions, each lasting three weeks. In each session, students went to classes for two hours a night, five nights a week: that is, thirty hours. To teach them, the teachers used Caleb Gattegno's *Words in Color*, a very ingenious (I now think, too ingenious) method. Used well, it can be very effective. But it makes great demands on teachers. That is, it can be used very badly.

Words in Colour is an approach to literacy invented by Dr. Caleb Gattegno. It first appeared in 1962. *Words in Colour* is a synthetic phonics system that uses color to indicate the phonetic properties of letters.

Janice Mattina, a dedicated educator whose mother was one of the pioneers in the use of *Words in Color* in the US and studied directly under Gattegno, explains his approach:

"By studying how children learn, Dr. Caleb Gattegno discovered the powers of children's minds and the skills they develop as they teach themselves everything they learned before they come to

school. These characteristics and powers of children are still undiscovered and unrecognized by most educators today who frequently dismiss the work of babies as having no relevance to further education. Gattegno studied how babies teach themselves to speak their native tongue, probably one of the most difficult learning one does in one's lifetime, yet all of us accomplished this without outside instruction and by the time we were three years young. That is to say, we taught ourselves at home. Gattegno marveled how each one of us is our own best teacher and what happened between home and school that caused so many of us to change from being these expert learners who could master the native tongue to poor learners when others taught us in schools. He identified many reasons for this decline, all of which could only be corrected by changing the way we view and teach youngsters. Gattegno knew that in order for children to continue to learn in school as well as they learned before they came to school meant that the school teachers would have to learn how not to interfere with the learners and their work. He reasoned that the teacher's emphasis was misplaced on creating and perfecting lessons. Gattegno posed that it is not the teaching that needs to be emphasized, but rather it was the learning that needed to be stressed. Once learning about learning becomes more important than learning about teaching, educators can become aware of the mental powers all children have developed before they come to school, and can permit the children to acquire new knowledge through the use of these skills which are already a part of the children's functioning. This new way of thinking about education was Gattegno's gift to all of us. He called it "the subordination of teaching to learning."¹

¹ Reference: Mattina, J. (2004). Words in Color. Retrieved on 11 Nov 2021 from: <https://www.centermontessori.org/writings-by-janice/words-in-color>

Few of the volunteer teachers in the program had previously used *Words in Color*; they themselves had been trained in an intensive course just before they began to teach the illiterates. I observed a good many of the teachers in one of the three sessions. Most of them used the method fairly well, one or two very well, a few very badly. The students and classes themselves varied; some classes were much more supportive; some students were much more bold and vigorous than others. I don't know what, if any, follow-up studies of the program were ever made, or what the students did with their newfound skill.

My strong impression at the end of my three weeks was that most of the students in the classes I had observed had learned enough about reading in their thirty hours so that they could go on exploring and reading, and could become as skillful as they wanted to be, on their own.

Conventional schooling obligates classrooms full of students to years of language classes, yet fails to produce more than a handful of excellent, lifelong readers. The schools (except for some) are not doing too well in creating an interest in reading. For the parents who are stuck in this cycle and do not have any better alternative available to them, there are many activities and resources that they can organize at home to facilitate the learning process of their children. When we were children, there used to be some magazines that regularly used to come to our house. We (I and my elder brother) used to eagerly wait for them and read them cover to cover. Our father used to take us to a large bookshop (called Feroz Sons) on monthly basis. We read many series of novels that we purchased from there. We were fortunate to have those things available to us. The options available nowadays, especially in Western countries, are very limited. A lot of what is produced for children to read here is written for monetary gains of the publishers and authors. Through them, they want to increase their own financial status rather than the cognitive abilities and morals of the children. This is a big dilemma in west and a lot of revolutionary efforts are required in order to provide

meaningful ethics-driven literature to our children.

1.2.3 ANOTHER EXAMPLE OF 30 HOURS TO READING ABILITY

Some years later I first heard of Paulo Freire, a Brazilian educator, and reformer, who, until the army ran him out of the country, had been teaching reading and writing to illiterate adult peasants in the very poorest villages.

Paulo Reglus Neves Freire (19 September 1921 – 2 May 1997) was a Brazilian educator and philosopher who was a leading advocate of critical pedagogy. He became familiar with poverty and hunger from an early age. During his childhood and adolescence, Freire ended up four grades behind, and his social life revolved around playing pick-up football with other poor children, from whom he claims to have learned a great deal. These experiences would shape his concerns for the poor and would help to construct his particular educational viewpoint. Freire stated that poverty and hunger severely affected his ability to learn. These experiences influenced his decision to dedicate his life to improving the lives of the poor. His situation changed later on in his life and he acquired several degrees and enjoyed several high positions including being the director of the Pernambuco Department of Education and Culture.

In 1962, he had the first opportunity for large-scale application of his theories, when, in an experiment, 300 sugarcane harvester were taught to read and write in just 45 days. In response to this experiment, the Brazilian government approved the creation of thousands of cultural circles for language learning across the country.

The 1964 Brazilian coup d'état put an end to Freire's literacy effort, as the ruling military junta did not endorse it. Freire was subsequently imprisoned as a traitor for 70 days. After a brief exile in Bolivia, Freire worked in Chile for five years. In 1967,

Freire published his first book, *Education as the Practice of Freedom*. He followed it up with his most famous work, *Pedagogy of the Oppressed*, which was first published in 1968. In 1969, he became a visiting professor at Harvard University.

After a positive international reception of his work, Freire was offered a visiting professorship at Harvard University in 1969.

His influential work *Pedagogy of the Oppressed* is generally considered one of the foundational texts of the critical pedagogy movement and was the third most cited book in the social sciences as of 2016 according to Google Scholar. This work features many social and anti-colonialist ideas and ideals.

One might say that his method was a kind of politically radical, grown-up version of the method Sylvia Ashton-Warner described in her books, *Spinster* and *Teacher*.

Sylvia (17 December 1908 – 28 April 1984) was a gifted but complex, often controversial, teacher, poet, novelist, autobiographer, and educational pioneer who broke new ground in New Zealand literature. Her ideas evolved over time. Though she remains stuck in heavy drinking and several behavioral issues, such as long absences from work and so on, her overall career was very rewarding and she was able to propose certain educational theories that were found by later educationalists to be very meaningful and practical.

She worked with Māori children in New Zealand for many years from the 1940s onwards. Experts flocked to study her methods for helping children to learn to read and write. She produced excellent results. Sylvia believed in organic reading and writing. Learning must be real. It must start from a person's experience and relate to their world. Children were then able to learn

quickly and, in the process, develop their inner strength.

Some of her educational techniques were very interesting and can be applied in schools nowadays too. The following examples have been quoted from article *A is for Sylvia Ashton-Warner: Her Pioneering Approach In Education*.² Many of the quotes below have been directly copied from the article.

Sylvia's three main principles of learning were as follows:

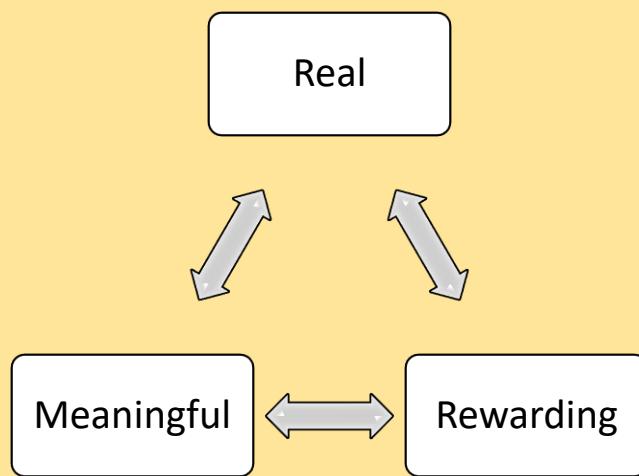


Figure: Sylvia's 3 principles of learning

Each of these objectives has been explained below:

1. Learning should be real:

Sylvia believed people developed best when giving voice to their own experiences. Such an approach is more likely to help them to develop their own literacy and shape their future lives. This *organic* approach develops what is already within; rather than imposing from outside. Explaining the meaning of the term 'organic', she says: "By organic, I mean that way of growth where the strongest thing pushes up ahead of the less strong. I

² Reference: Pegg, M (2020). *A is for Sylvia Ashton-Warner: Her Pioneering Approach In Education*. Retrieved on 12 Nov 2021 from:

<https://www.thepositiveencourager.global/sylvia-ashton-warners-pioneering-approach-in-education/>

think of trees growing in a clump... The strongest get to the light. In speaking of a child's mind I mean the strongest impulses push up..."

Sylvia's recognition that each person has a 'key vocabulary', a set of words with a special meaning relating to their emotional life, enabled her to develop a reading scheme for children who were otherwise failing at school.

2. Learning should be meaningful

Learning must be relevant: it must be able to be used today and tomorrow. Nowadays this sounds obvious, but in the 1940s the traditional approach saw children as 'empty vessels that must be filled'. The pupils were then judged on their ability to memorize and repeat this information.

Sylvia believed it was vital for children to learn from the wisdom of others. But the best way to stoke a child's hunger to read and write was to focus on the events that made up their daily lives. She wrote: "Back to these first words; to these first books. They must be made out of the stuff of the child itself... I reach a hand into the mind of the child, bring out a handful of the stuff I find there, and use that as our first working material... And in this dynamic material, within the familiarity and security of it, the Māori finds that words have intense meaning to him, from which cannot help but arise a love of reading... The love of reading is born, and the longer his reading is organic the stronger it becomes until, by the time he arrives at the books of the new culture, he receives them as another joy rather than as labor."

She also began to write her own 'textbooks' for the Māori pupils. These related to the children's experiences, rather than the conventional Westernised books.

Her method of making children learn writing was to invite them

to draw pictures and add their own captions. She invited them to use their keywords (for which they carried their own specific meanings) as a basis to build their stories. They built up their words into sentences and create books about their experiences. Children wrote one word, then two sentences, then three, until six-year-olds were writing half a page a day and seven-year-olds a page or more a day. The drama and genuineness of these writings could never be captured in a bought book. It could never be achieved even in the most faithfully prepared teaching books. No one book could ever hold the variety of subjects that appears collectively in the infant room each morning. Moreover, it is written in the language they use themselves.

3. Learning should be rewarding

Just like how students of programming languages are taught to write their first “Hello World” program pretty much straight away, Sylvia also organized small wins and successes for her students. Her approach enabled children to get short-term rewards – learning a word, writing a page, creating a book, or creating another work. They then developed the appetite for achieving medium and long-term rewards – such as rehearsing and performing a play. Much of older-style schooling was based on the idea of ‘delayed gratification’. Teachers implied: “You must learn these things by rote. You may not see the point now, but one day it will make sense.” They followed the ‘factory model’. Knowledge was broken into pieces, like jobs on the production line. The pupils were expected to master each piece without seeing the whole picture. This process increased as children got older. Peter Senge once observed: “Secondary education is a more purely industrial age institution than any business.” She questioned and changed this concept.

Examples of Sylvia’s concepts in practice:

Sylvia calls the children’s attention each morning by playing

some classical music. She asks the class to tackle their work, then invites each child to her in turn. Gay is the first child to come to her desk.

Sylvia asks: "What word do you want today?"

Gay replies: "House."

Sylvia writes the word on a piece of cardboard. She then asks Gay to trace the word with her finger and say it out loud.

Gay 'owns' the word, it comes from her guts. Sylvia makes sure that Gay says the word, sees the word, and feels it in her body.

She gives Gay the cardboard and asks her to keep her 'word' for the day.

Sylvia repeats the process with each child. When the class finishes, she collects all the words on separate pieces of cardboard.

The next morning Sylvia starts the class by tipping the cardboard words onto the floor. She tells the children:

"Find your word."

Gay leaps from the chair and rummages in the pile.

"House," she shouts, "I have found my word."

Children have two visions, an inner vision, and an outer vision, says Sylvia, and it is the inner vision that burns brightest.

Gay grasps the word which she spoke from her inner vision.

Sylvia asks each child to choose a partner, speak their words, and hear their partner's words.

While the children teach each other, she repeats the process of inviting each child to choose their word for today. They build up

what Sylvia calls their Key Vocabulary.

What happens if Gay fails to find her word? Sylvia rips up the piece of cardboard.

The word has failed the 'one look' test and cannot have any great meaning for Gay.

Usual Classrooms (not Sylvia's) often display Jack and Jill illustrations for introducing the reading vocabulary to five-year-olds, says Sylvia, but it is a vocabulary chosen by educationalists in Auckland or London. Gay owns only those words that come from deep within herself! She is more likely to love these words and want to write them on paper.

Once the children know the joy of creating their own words, says Sylvia, they reach out longingly to learn about other cultures. She believes that: Reaching out for a book must become an organic action.

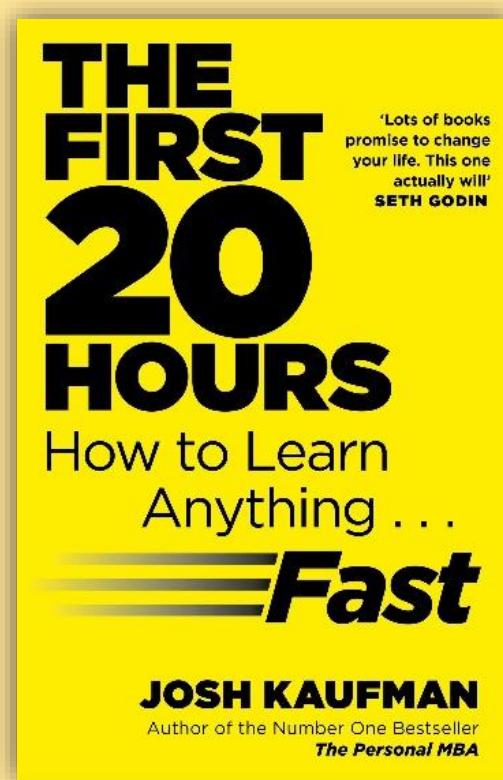
Let us now come back to Freire's approach.

That is, he began by talking with these peasants about the conditions and problems of their lives (this was what the army didn't like), and then showed them how to write and read the words that came up most in their talk. He too found that it took only about thirty hours of teaching before these wretchedly poor and previously demoralized peasants were able to go on exploring reading on their own.

Thirty hours. One school week. That is the true size of the task.

It is interesting to note that the above discussion is about convincing people that 30 hours are sufficient to learn a skill such as reading. However, there has been some modern research and writings that a skill can be acquired in 20 hours too. The book *The First 20 Hours* explains how a skill can be

learned in just 20 hours by identifying where you wish to see yourself in terms of the skill being learned, identifying major components of the learning journey, giving it 40 minutes a day (20 in the morning and 20 before night – what is learned before sleeping is consolidated during the sleep), removing the barriers, self-correcting and engaging in the practice. The author provides various examples of how he practically observed this process work.



1.3 DISCOVERING LETTERS

Once again, a child has reminded me how various, ingenious, and unexpected are children's ways of exploring the world around them, in particular the world of letters and numbers. My teacher in this case was five-year-old Chris, a happy and energetic boy who comes to my office almost every day with his mother, Mary, and is now completely at home here.

His father drives a very large tow truck, the kind that is used for towing

other trucks, so it is not surprising that many of Chris's favorite toys are little cars and trucks, some of them tow trucks. He has a kind of track for these trucks to run on, a collection of straight, curved, and other pieces, which he joins together to make a highway, complete with overpasses, intersections, and so on. One of his favorite games, which he plays for hours, is running his cars and trucks around this roadway in various complicated ways, all the while making up some story to go with them, mixed now and then with the wavering note of a police car. A couple of times in the past months he has noticed that some of the pieces of this roadway, by themselves or joined with another piece or two, make a shape that looks like a letter, and once in a while he will show me one of these shapes and perhaps tell, perhaps ask, me what it is. But he has not done this very often; he is mostly interested in the trucks as trucks and the road as a road.

Today, while lying on the floor playing with the trucks, he pointed out to me as I walked by that one of his pieces of road made the letter J, another the letter T, and another (with a little use of the imagination) the Letter I. He had several J-pieces and began putting some of his "letters" together and asking me what the words said. I pronounced them as best I could, easy when there was a vowel in the word, hard when there wasn't, in which case I would make some kind of hissing and sputtering noise.

A little later, walking by him, I pointed out that a big section of his road had made a very large letter U, so once again he began making "words" and asking me what they said. After a number of imaginary and/or unpronounceable words, I put the J on one side of the big U and the T on the other, and said they made a real word, jut. He took note of that, without showing any great interest. A little later he found a piece that would work as a letter S, so after pronouncing a number of other non-words and seeing the letters J, T, I, and S close to the big U, I made the word Jitsu from jujitsu, which he knew. Again, he noted the fact, but did not ask me for any other real words, nor did I press the matter.

He continued with this a short while longer, and then stopped, turning to one of the hundred or more other projects he invents to pass and enjoy

the time. Not long after, his mother and Steve, who also works in the office, began to assemble a large number of packages of books, to load on a hand truck to take to the post office, and soon Chris rushed to help. Any time a job comes up that involves moving large objects, he wants to be part of it.

Like many little children, he loves struggling with packages or other objects that he can just barely lift and hold; it makes him feel stronger, more capable, more useful, and closer to the world of grown-ups.

From time to time, in sudden bursts, Chris returned to his Letter games. What has to be learned from these games, beyond the names and shapes of the letters he now knows? Among other things:

- that letters are made-up shapes;
- that not all shapes are letters;
- that letters can be joined together to make words;
- that not all combinations of letters make words that sound good or mean anything;
- that shapes or objects designed to be seen or used one way can be seen or used in other very different ways;
- and that doing this is often interesting and exciting.

All this knowledge of shapes and numbers he has made for himself out of his own experience, for his own reasons. He really knows it and will never forget it. It is as much a part of him as his arms and legs. He has not learned it to please me, though it may please him, now and then, to show me that he knows it. With great but patient curiosity, I wait for the next time he may choose to show me something else he has learned, in this busy office where he is free to explore.

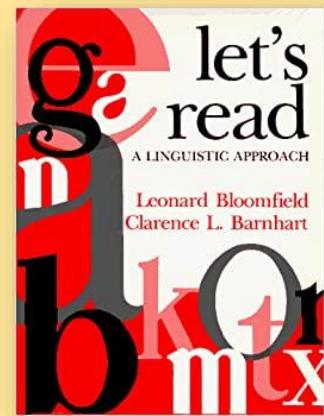
1.4 EXPLORING WORDS

Let's Read is the title of a book by Leonard Bloomfield and Clarence

Barnhart, which could help many children teach themselves to read. This was not the authors' idea — they meant parents to use the book to teach their children to read. I think doing this is not useful or necessary and will in most cases be harmful. Learning to read is easy, and most children will do it more quickly and better and with more pleasure if they can do it themselves, untaught, untested, and helped only when and if they ask for help.

Let's Read presents a simplified method of teaching reading based on the alphabet and centered around spelling patterns. Bloomfield (1887-1949), a renowned linguist, created these lessons in order to teach his own children to read. This book was published for the first time by Wayne State University Press in 1961. It has been reprinted many times and is a recognized classic in the field of reading instruction.

Bloomfield was a strong critique of the way in which schools teach languages. He believed that schools wasted a lot of time; Students in schools are often unable to learn in years what can be learned in months.



This book and others like it, however, can be useful for children. After sixty-odd pages of unnecessary instructions comes the good and helpful part of the book. At the top of the page are all the one-syllable English words that end in *-an*: can, dan, fan, man, nan, pan, ran, tan, an, ban, van. Then come a number of short sentences using these words. Next come the *-at* word bat, cat, fat, hat, mat, nat, pat, rat, sat, at, rat, vat—with sentences using both *-an* and *-at* words. The next page has *-ad* words, and the next pages, in

gum	gum	gun	gum	Gus	60
gun	gun	gut	gum		
hum	hum	hug	hum	ham	
but	hum	him	hum	hum	
sum	sum	sup	sum	Sam	
sup	sum	sun	sun	sun	
yum	yum	hum	yum	yam	
gum	yum	sum	yum	yum	
ham	Sam	yam	gam	tam	
hum	sum	yum	gum	tum	
					68

Figure 2: A sample page from Let's Read

order, words ending in *-ap*, *-ag*, *-am*, *-ab*, *-al*, then *-ig*, *-in*, *-id*, and so on.

We could, of course, figure out those words for ourselves, but it is handy to have them all printed out, in big print. Each page has sentences using the new words of that page, plus all the words that went before. They don't make very interesting stories, but, as the authors rightly point out, at this stage children find it exciting enough just to figure out what the words say. Later, when they have more words to work with, the stories get a little better. But by the time children work their way to page 100 (or even much sooner), they will know enough about how the reading game works to start puzzling out real books, magazines, signs, cereal boxes, and so on.

A book like this is best for a child to browse through. When my niece was about four, I gave the book to my sister, thinking she might use it to teach her daughter. However, neither my niece nor, later, her younger brother would stand for being taught – they just refused to go along. But the book was left in sight where the little girl could get at it, and she was encouraged to think of it as hers. Certain pages are covered with little brown marks that I take to be her fingerprints. She must have spent quite a few months looking at those pages, thinking about them, before she figured out the system and went on to look at other books. I wasn't there when she was teaching herself to read and as she did most of the work in private, often with her door shut, asking very few questions of anyone, no one knows exactly what she did.

I would guess that many little children would like to browse through such a book. It is big, grown-up, and official-looking, obviously not a "children's" book. There are only four pages of line drawings in it; all else is print. But much of the print is large enough to be easy for little children to see, and many of the words are small enough to be easy for them to figure out. If I had young children, I would give them this book (along with others), and let them decide how they wanted to use it – if at all. If a child asked me to read it aloud, I would, perhaps moving my finger under the words as I read them.

Though, on second thought, I suspect that some children would take this to be teaching and make me stop doing it. If the child asked questions about this word or that, I would answer. Otherwise, I would leave the child and the book alone.

1.5 READING READINESS

1.5.1 *A common mistake regarding 'reading readiness'*

Our professional experts on the teaching of reading have advocated a great many foolish things, but none more foolish than the notion that the way to get children "ready to read" is to show them a lot of books full of nothing but pictures and ask them a lot of silly questions about them.

The proper analogy can be found, as is so often true, with children learning to speak, that extraordinary intellectual feat we all accomplished before the adults got it into their heads that they could "teach" us. Children get ready to speak by hearing speech all around them. The important thing about that speech is that the adults, for the most part, are not talking in order to give children a model. They are talking to, each other because they have things to say. So the first thing the baby intuits, figures out, about the speech of adults, are that it is serious. Adults talk to make things happen. They talk, and things do happen. The baby thinks, feels, that this is a pretty serious activity, well worth doing.

1.5.2 *The relation of pictures in children books and interest in reading*

When I was a kid, I taught myself to read, as many children do. Nobody taught me, and, as far as I can remember, nobody helped me very much or read aloud to me. When we were a little older, a grandmother read aloud to my sister and me, but by then we were already skillful readers. She read the Dr. Dolittle books by Hugh Lofting, and to sit on the sofa, one on each side, was a very happy scene, all the more so because she read these stories with the greatest seriousness, without a touch of sentimentality or condescension, no "cute" inflections in her voice.

Hugh John Lofting (14 January 1886 – 26 September 1947) was an

English author trained as a civil engineer, who created the classic children's literature character of Doctor Dolittle. It first appeared in illustrated letters to his children written by Lofting from the British Army trenches in the First World War. Not wishing to write to his children about the brutal war, he wrote imaginative letters, which later became the foundation of the successful Doctor Dolittle novels for children.

Hugh Lofting's character, Doctor John Dolittle, is a physician who could speak to animals. He shuns human patients in favor of animals, with whom he can speak in their own languages. He uses his abilities to speak with animals to better understand nature and the history of the world.

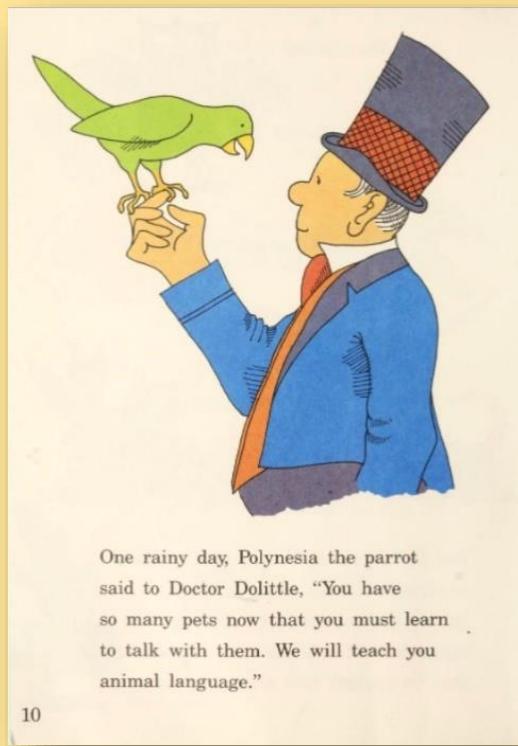


Figure 3: A sample page from a modern adaptation of one of the books by Hugh Lofting

One of the things that made me want to read was that in those days (long, long ago) children's books had very few pictures in them. The few they contained were magnificent, many painted by Andrew Wyeth's father, N.

C. Wyeth. Pirates, knights, Scottish Highland chief's great pictures. But there weren't enough of them in any one book to give me any idea of what the stories were about, so I realized that to find out what those pictures meant I was going to have to read the book. Which I soon learned to do.

1.5.3 What children need the most for getting ready to read

What children need to get ready for reading is exposure to a lot of print. Not pictures, but print. They need to bathe their eyes in print, as when smaller they bathe their ears in talk. After a while, as they look at more and more print, these meaningless forms, curves, and squiggles begin to steady down, take shape, become recognizable, so that the children, without yet knowing what letters or words are, begin to see, as I once did myself, after looking at a page of print in an Indian typeface, that this Letter appears here, and that group of letters appears there, and again there. When they've learned to see the letters and words, they are ready to ask themselves questions about what they mean and what they say. But not before — just as, when I am learning a foreign language, there is no use telling me that such and such word means such and such a thing until my ears have become sharp enough to pick it out from other people's talk.

1.5.4 Some practical suggestions

All of which leads to a concrete suggestion. I propose that anyone who wants to make it easier for children to discover how to read should use as one of the "reading readiness materials" the large-print edition of the New York Times. The print is large enough for children to see and recognize. The paper is clearly a part of the adult world, and therefore attractive. It is serious. It has real information in it. It can be put on walls but is not so precious that one has to worry about its being torn or defaced.

Beyond this, I would suggest that we put into the visual environment of young children, both in school and out, and not just in the pre-reading years but for a while thereafter all kinds of written stuff from the adult world. Thus, among other things, timetables, road maps, ticket stubs, copies of letters, political posters, bills, various kinds of official forms,

copies of bank statements, copies of instruction manuals from various machines, copies of contracts, warranties, and all those little throwaways that we find in banks.

In short, lots of stuff from that adult world out there where all those people are doing all those mysterious and interesting things. Oh, and old telephone books, above all, classified ad telephone books. Talk about social studies; a look at the Yellow Pages tells us more than any textbook about what people do, and what there is to do.

1.6 INVENTING THE WHEEL

1.6.1 *Paul's incredible journey*

Gyns at Wrk, by Glenda Bissex, is a delightful and revealing book, the detailed and loving account of how the author's son, Paul, did what Seymour Papert talked about in Mindstorms: that is, learned **without being taught**.

Harvard University Press provides the following overview of the book Gyns at Wrk:

When he was five and a half years old, Paul Bissex wrote and posted this sign over his workbench: DO NAT DSTRB GNYS AT WRK. The "work" from which this "genius" refused to be "disturbed" was the work typical of all children, namely, the task of learning how to write and read. In Gyns at Wrk, Glenda Bissex goes far beyond the chronicle of her son's accomplishment to provide the first in-depth case study of a child's confrontation with written language, rich in revelations about the nature and processes of the mind.

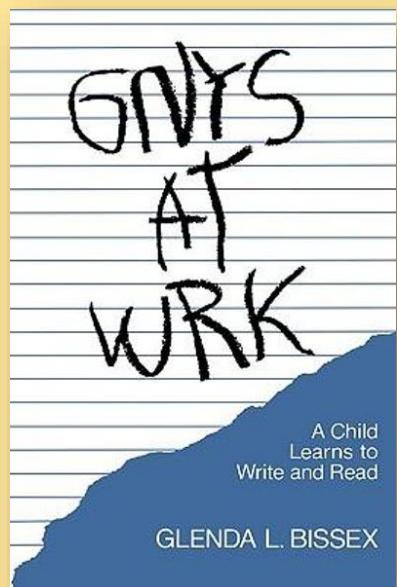


Figure 4: Title of the book
'GYNS AT WORK'

Paul begins by writing notes in a system of his own invention – like IEAVGAWNTOOTHESTOR for “I have gone to the store” – and this system becomes more elaborate as he goes on to create stories, games, and signs. Eventually, the system merges with conventional written English as Paul learns to separate words and to associate letters not with their names but with sets of possible sounds.

Glenda Bissex shows how the evolution of Paul’s writing ability is closely intertwined with his reading development – in Paul’s own words, “once you can write a word you can read it.” She also makes an intriguing comparison between Paul’s schoolwork and his endeavors at home and explores the influence of his personal interests and worldview on his facility with words. Her study is a unique, detailed account of the “genius” that is, quite simply, the human capacity for language.

From the description above and below, one can say that this was an excellent way to facilitate writing, spelling, reading, and idea generation of a spoken language. There is a lot in this that the parents and teachers can extract from it and put to practice.

John explains Paul’s learning journey as follows.

He built for himself his own, at first crude, models of written English, and constantly refined them until they finally matched written English of the world around him. Gyns at Wrk is also a splendid account and example of the ways in which sympathetic and trusting teachers can be of use to learners, not by deciding what they are to learn but by encouraging and helping them to learn what they are already busy learning. Like Mindstorm, it gives powerful ammunition to parents who are trying to deal with school systems and/or to teachers and others who are trying to change them.

Paul Bissex began his writing at age five with an indignant note to his mother, who, busy talking with friends, had not noticed that the child was trying to ask her something. After trying a few times to get her attention

he went away but soon returned with this message printed on a piece of paper: RUDE. Luckily for him, his mother was perceptive enough to decode the note ("Are you deaf?"), understand its importance, and quickly give the boy the attention he had been asking for.

As the boy began to explore written English, his mother paid steady attention to the ways in which he was doing it. In her preface, Mrs. Bissex writes: When I began taking notes about my infant son's development, I did not know I was gathering "data" for "research"; I was a mother with a propensity for writing things down... When Paul started spelling I was amazed and fascinated. Only somewhat later did I learn of Charles Read's research on children's invented spelling. Excited by his work I started seeing my notes as "data"... What I hope this study offers, rather than generalizations to be "applied" to other children, is encouragement to look at individuals in the act of learning. And I do mean act, with all that implies of drama and action... a case study this detailed aid extended over time would have beat unmanageable were I not a parent.

In the preface, Mrs. Bissex describes how Paul felt about her research:

At the beginning, Paul was an unconscious subject, unaware of the significance of my tape recorder and notebook. When he first became aware, at about age six, he was pleased by my interest and attention. By seven, he had become an observer of his own progress. When I ...had Paul's early writings spread on my desk he loved to look at them with me and try to read them... Paul had observed me writing down a question he had asked about spelling, and I inquired how he felt about my writing it down. "When I'm older I can see the stuff I asked what I was little," he commented. At eight he was self-conscious enough to object to obvious observation and note-taking, which I then stopped... He still brought his writings ... to me, sharing my sense of their importance. At nine he became a participant in the research, interested in thinking about why he had written or read a thing as he once had... The study has become a special bond between us, an interest we share in each other's work, a mutual enjoyment of Paul's early childhood and of his growing up. I have come to appreciate certain qualities in my son that I might not have seen

except through the eyes of this study.

1.6.2 Importance of making children partner in the process of discovery

When I was teaching fifth grade with Bill Hull and beginning to watch and listen carefully to what children said and did in the class, I used to write down notes, in handwriting so tiny that they couldn't easily read it. They knew I was writing about them, and at first said, a little suspiciously, "What are you writing?" But as time went on and they began to understand that I did not see them as strange laboratory animals, but liked and respected them and was trying to see how the world of school looked through their eyes, they felt better about my note-taking though it would probably have been better if I had told them more specifically what I was trying to learn from their work. In other words, I could have made them more conscious partners in my research.

1.6.3 What comes first: Reading or writing?

Many more children— I have no idea how many— seem to go from writing to reading than the other way around. Gny's at Wrk is by no means the first work I have read about children's invented spellings. Many years ago I read a most interesting article on the same subject by Carol Chomsky, who has done much good work in this area. One thing about her article I remember vividly. She reported that many children spelled words beginning in tr— tree, train, and so on— either with a *eh* or an *h* at the beginning. For a second this baffled me. But by this time I had learned to look for reason in children's "mistakes." I began to say "tree, train," et cetera, listening carefully to what sounds I was making and found to my astonishment that what I was actually saying sounded very much like "chree" and "chrain."

1.6.4 Understanding the underlying principles

Teaching phonics is not a necessity:

It is worth noting that neither Glenda Bissex nor the parents of many other children who learned to write English in their own invented spelling had

taught them "phonics," or taught them to write or even much encouraged them to write (except perhaps by their own example). The children had been told and helped to learn the names of the letters. From these, they had figured out for themselves which consonants made which sounds. Like Paul Bissex, they began by leaving vowels out of their words altogether, producing writing much like the Speedwriting that many adults later struggle and pay to learn.

Children find it easier to write what they want to write (not what they are asked to write):

As Mrs. Bissex makes clear in example after example, Paul did not "learn to write," learn what schools would call the skills of writing so that later he could use them to write something. From the beginning, he wrote because he had something he wanted to say, often to himself, sometimes to others. Paul, like his parents, wrote (and read and talked) because what he was writing (or reading or saying) had meaning to him as an individual and as a cultural being. We humans are meaning-making creatures, and language, spoken and written, is an important means for making and sharing meanings.

Children are researchers in their own way:

In her work with Paul, Mrs. Bissex asked him many questions about his learning and gave him many of what in another context might be called tests. But the purpose of these tests was not, as with almost all school tests, to find out what he didn't know, or to prove that he hadn't learned what he was supposed to have learned. His mother knew he was learning. What she wanted to know, and what he knew she wanted to know, was how he was doing it. She was interested in his work in the way a scientist (which she was) might be interested in the work of another scientist (which he was). In this very important sense, they were equals. She might know more about English, but he knew more than she did about what he knew about English and how he was learning more, and his knowledge was at least as important to her as hers was to him.

Importance of freedom to decide fearlessly:

In setting his own tasks, Paul was able to keep them at the challenge level. He was not content to repeat his accomplishments but spontaneously moved on to harder tasks... He set up a progression of increasingly difficult tasks for himself as many other children spontaneously do. This is what all children do as they grow up – until they get to school. What all too often happens there is that children, seeing school challenges as threats, which they often are – if you fail to accomplish them, you stand a good risk of being shamed or even physically beaten – fall more and more out of the habit of challenging themselves, even outside of school: "... Inventive spellers start from the assumption that they can figure things out for themselves. Perhaps this is why so many of them learn to read before formal instruction."

This is my objection to books about "Teach Your Baby This" and "Teach Your Baby That." They are very likely to destroy children's belief that they can find things out for themselves and to make them think instead that they can only find things out from others.

I agree with the idea of providing freedom, the opportunity to experiment fearlessly, and discover things – however, I am also inclined towards defining certain boundaries for it. It might sound contradictory to what is mentioned here but it is not. It seems like a great idea to have 'perfect freedom', however, it comes with many pitfalls. When children reach the age when certain hormones start to release in their bodies, they try to do some of the things that can be spiritually damaging for them. The norms and criteria of right and wrong should be clearly discussed and agreed with them so that the criteria of right and wrong prevalent in the society and among their friends doesn't become their criteria too (talking especially about the Western context where Muslims live as a minority in most of the countries). I fully appreciate that this is a part of tarbiyyah and is a long-term thing. It has to start early and lovingly. However, in all situations, there should be some fences on either side of the field. In that field, the kids should be allowed to move in whatever way they like and

explore whatever they wish, and stop for leisure for however long they want, but they should remain within those fences. The fences should not be what society has defined for us and them but the ones which our religion has set. There is a beautiful hadith on this topic. According to the mafhoom of that, the example of a believer is that of a horse that is tied to the peg through a rope. It can move freely as much as that rope allows it (and the rope is not small; it is pretty big and provides a lot of flexibility and opportunity). However, the horse cannot move beyond what the rope allows. That is where the allowable boundary end. Beyond it are the hudood of Allah which should not be crossed. The same should be explained to them in a meaningful discussion about the concept of freedom and boundaries.

Errors are sources of information:

As Kenneth Goodman, Charles Read, and Piaget have shown, children's errors are not accidental but reflect their systems of knowledge. If teachers can regard errors as sources of information for instruction rather than mistakes to be condemned and stamped out, students, [they] should be able to assume this more constructive view, too.

This is exactly the point that Seymour Papert makes in Mindstorms. When children working with computers make "mistakes" – that is, get from their computer a result other than the one they wanted – they tend to say, if they have newly arrived from school, "it's all wrong," and they want to start over from the beginning. Papert encourages them to see that it's not all wrong, there's just one particular thing wrong. In computer tinge, there is a "bug" in their program and their task is to "de-bug" it – find the one false step, take it out, and replace it with the correct step.

When I taught fifth grade, many of my students, filling out forms, would identify themselves as "grils." I was always touched and amused by this mistake, but I thought it was just foolish or careless. Not for many, many years did I understand that the children calling themselves "grils" were thinking sensibly, were indeed doing exactly what their teachers had told

them to do sounding out the word and spelling it a sound at a time. They had been taught, and learned, that the letters gr made the sound "gurr." So they wrote down gr. That left the sound "ul." They knew that / had to come at the end, and they knew that there was an i in the word; so obviously it had to be gril. Countless adults had, no doubt, told them that gril was wrong, and I joined the crowd. But it was futile; they went on trying to spell girl phonetically, as they had been told to, and could only come up with gril. If I had had the sense to say, "You folks are on the right track, only in this case English uses the letters g-i-r to make the sound 'gurr,'" they would have said, "Oh, I see, "and could have done it correctly.

1.7 WORDS IN CONTEXT

1.7.1 *Meanings of words are best understood in their context*

Children reading for their own pleasure rarely stop to ask about words. They want to get on with the story. If the word is important, they can usually make a good guess about what it is. "He drew an arrow from his quiver." Easy to see that a quiver is some sort of gadget to put arrows in. More complicated words they figure out by meeting them in many different contexts.

People learn to read well and get big vocabularies, from books, not workbooks and dictionaries. As a kid, I read years ahead of my age, but I never looked up words in dictionaries and didn't even have a dictionary. In my lifetime I don't believe I have looked up even as many as fifty words - neither have most good readers.

1.7.2 *How are dictionaries made?*

Most people don't know how dictionaries are made. Each new dictionary starts from scratch. The company making the dictionary employs thousands of "editors," to each of whom they give a list of words. The job of the editors is to collect as many examples as possible of the way in which these words are actually used. They look for the words in books, magazines, newspapers, and so forth, and every time they find one, they cut out or copy that particular example, building up a file of clippings

where the words had been used. Then, reading these files, they decide from the context what the writer in each case had meant by the words. From these, they make the definitions. A dictionary, in other words, is a collection of people's opinions about what words mean, as other people use them.

1.7.3 What if no meaning is clear from the context

If I meet a new word, and cannot tell from the context what it means, it isn't true that I have gained nothing. I am like the dictionary editor – I have one example for the word. Next time I meet the word I will have another example, and so on. By the time I have met a word ten or twenty times, I will almost certainly have a very good idea of its possible meanings.

1.7.4 What is more important: understanding of words or preservation of interest to read?

For children reading (or adults, for that matter), the most important thing is not that they should understand all of what they read. No one does; what we get out of a piece of reading depends in large part on the experience we bring to it. What is important is that children should enjoy their reading enough to want to read more. The other thing that is important is that they should become better and better at getting meaning from context, for that is the supreme skill of a good reader. The trouble with telling children what words mean, or asking them to ask the dictionary to tell them, is that they don't get a chance to figure out the meaning of the word. Figuring out what you don't know or aren't sure of is the greatest intellectual skill of all.

1.8 SENSIBLE PHONICS

1.8.1 Choral Reading:

Years ago, a psychologist friend of mine, Robert Kay, told me about a very interesting way of teaching reading called *Choral Reading*. It was basically like the old "Sing Along with Mitch" TV show.

Initially airing as a one-shot episode of the NBC television show *Startime* on 24 May 1960, *Sing Along with Mitch* went on to become a weekly series in 1961 as a community sing-along program hosted by Mitch Miller and featuring a male chorus. In keeping with the show's title, viewers were presented with lyrics at the bottom of the television screen. One of the singers in Miller's chorale, Bob McGrath, later went on to a long and successful career on the PBS children's show *Sesame Street* (he was a founding member of the "human" cast in 1969 and McGrath became its longest-serving cast member until his enforced retirement in 2016).

As the popularity of the TV show rose, Miller produced and recorded several "*Sing Along with Mitch*" record albums, complete with tear-out lyric sheets.

Sing-Along with Mitch ran on television from 1961 until the network canceled it in 1964 because of changing musical tastes. Selected repeats aired briefly on NBC during the spring of 1966. The show's primary audience was over the age of 40 and it did not gain the favor of advertisers targeting the youth market.



Figure 5: A set of Sing Along with Mitch Show

Choral reading is reading aloud in unison with a whole class or group of students. Choral reading helps build students' fluency, self-confidence, and motivation. Because students are reading aloud together, students who may ordinarily feel self-conscious or nervous about reading aloud have built-in support.

John explains it as follows.

The teacher would put on the board, in letters large enough for all the children to see, whatever they were going to read. Then she or he would move a pointer along under the words, and at the same time, the children would read the words. The children who knew a word would read it; those who were not sure would perhaps read softly; those who didn't know at all would learn from those who were reading. No one was pointed out or shamed, all the children did as much as they could, and everyone got better.

1.8.2 Learning to read through singing

Also many years ago, before the place became rich and stylish, my parents lived in Puerto Vallarta, Mexico. Now and then they used to visit a small elementary school not far from where they lived. The teacher taught reading through singing. The school was poor – now it is probably five times as rich, and has all the latest reading materials, and five times as many reading problems. The teacher wrote the words to a song on the board – perhaps a song that all the children knew, perhaps a new song that she taught them – and as she pointed at the words, the children sang them and, so doing, learned to read.

1.8.3 Learning to read while looking at a word and listening to it at the same time

Any number of parents have told me a similar story: they read aloud to a small child a favorite story, over and over again. One day they find that as they read the child is reading with them, or can read without them. The

child has learned to read simply by seeing words and hearing them at the same time. Though children who learn this way probably couldn't answer questions about it, they have learned a great deal about Phonics. Nobody taught them to read, and they weren't particularly trying to learn. They weren't listening to the story so that they would be able to read later, but because it was a good story and they liked sitting on a comfortable grown-up lap and hearing it read aloud.

1.8.4 Phonics of two vowels coming together

In many first, second, and third-grade classrooms, I used to see signs on the walls—people tell me they are still up there—saying, "When two vowels go out walking, the first one does the talking." (Typical of the cutesy-wootsy way in, which schools talk to young children.)

What this means, of course, is that there are many vowel pairs bAlt, bEAt, bOAt, et cetera—in which the first of the two vowels makes the sound. OK to point that out to children, though the best way to do this would simply be to give examples. But the trouble with the cute little sentence that the schools have cooked up to tell children this is that it contains two vowel pairs, both of which violate the rule. This might not bother some children, either because they already understand what the rule is telling them or (more likely) because they don't think about anything they hear in school. But some children do think about what they see and hear, and it is just such thoughtful and intelligent children who might very well be thrown for a loop by this dumb sentence on the wall.

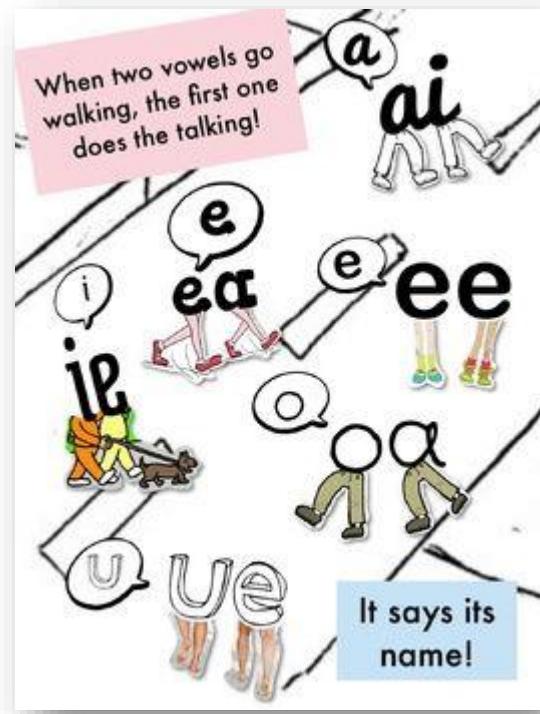


Figure 6: A sample poster which explains about two vowels coming together

1.8.5 Phonics of long and short vowels

Another confusing part of so-called phonics teaching is all the talk about "long" and "short" vowels. Among the sounds that vowels make is one that is the same as the name of the vowel, as in bAke, bEEt, and rOse. The schools have traditionally called these sounds the "long" vowel sounds. By contrast, they give the name "short" to the vowel sounds in bAck, bEt, bit, and so on. Now, the fact is that there is nothing longer about the sound of a in bAke than its sound in bAck. We can say either word quickly or slowly; make either vowel sound as long or short as we wish. Again, calling one of these vowel sounds "long" and the other one "short," though it makes no sense—one might as well call one blue and the other green—might not bother the kind of children who (as I was) are ready to parrot back to the teacher whatever they hear, never mind what it means or whether it means anything. But it might be extremely confusing and even frightening to other kinds of children, including many of the most truly intelligent.

It might not even do any harm to call the sounds of bAck, bEt, and bit "short" vowels, as long as we made it clear that there was nothing really any shorter about those sounds, and that we just used this word because we had to use some word, and people had been using this one for quite a while, so we decided we'd stick to it. After all, that's why we call dogs "dogs"; there is no particular sense to it, it's just that we've been doing it that way for a long time. But to say to children things that make no sense as if they did make sense is stupid and will surely cause some of them great and needless confusion.

1.8.6 Cause of this problem with phonics education

These two small and perhaps not very damaging pieces of nonsense, and other much larger and more damaging ones that I will talk about next, were not invented and never would have been invented by parents teaching their own children. They were invented by people trying to turn a casual, natural, everyday act into a "science" and a mystery.

1.8.7 Common mistakes in teaching phonics

Two Simple rules:

Let's now take a broader look at the teaching of reading, more specifically, what most people call "phonics." According to a newspaper report, a Board of Education "reading expert" in Chicago had made a list of 500 reading skills (later cut to 273) that children needed to learn in elementary school. What those lists could be made up of, I cannot imagine and do not want to know. In a word, they are nonsense.

The fact is that there are only two general ideas that one needs to grasp in order to be able to read a phonic language like English (or French, German, and Italian, as opposed to, say, Chinese):

- (1) written letters stand for spoken sounds;
- (2) the order of the letters on the page, from our left to our right, corresponds to the order in time of the spoken sounds.

It is not necessary for children to be able to say these rules in order to understand and be able to use them. Nor is it a good idea to try to teach them these rules by saying and then explaining them. The way to teach them— that is, if you insist on teaching them— is to demonstrate it through very simple and clear examples.

Aside from that, what children have to learn are the connections between the 45 or so sounds that make up spoken English and the 380 or so letters or combinations of letters that represent these sounds in written English. This is not a large or a hard task. But, as in everything else, the schools do a great deal to make it larger and harder.

Teaching sounds of individual letters:

The first mistake they make is to teach or try to teach the children the sounds of each individual letter. In the case of consonants, this amounts to telling the children what is not true. Of the consonants, there are only six or seven that can be said all by themselves - *s* (or the *c* in *niCe*), *z* (or the *s* in *riSe*), *m*, *n*, *v*, *f*, *j*(or the *g* in *George*) -plus the pair *sh*. There are borderline cases of *l*, *r*, *w*, and *y*, but it seems wiser to let children meet

these sounds in syllables and words. As for the rest, we cannot say the sounds that *b*, or *d*, or *k* or *p*, or *t* make, all by themselves. *B* does not say "buh," nor *d* "duh." *B*ig does not say "buh-ig," nor rub "ruh-buh." These letters don't make any sound, except perhaps the faintest puff of air, except when they are combined with a vowel in a word or syllable. Therefore, it is misleading and absurd, as well as false, to try to teach them in isolation.

Teaching vowel sounds separately

It is equally foolish and mistaken to try to teach the vowel sounds in isolation, in this case, because each vowel makes a number of different sounds, depending on what consonants it is combined with. Since we can't tell what the letter *a* says except as we see it joined with consonants, then it makes sense to introduce the sounds of *a* (or any other vowel) only in the context of words and syllables.

1.8.8 The correct method of teaching phonics

All we have to do then is to expose children to the two basic ideas of phonics: that written letters stand for and "make" spoken sounds, and that the order of the written letters matches the order of the spoken sounds. The first we can do very easily by any kind of reading aloud, whether of words in books, or signs, or whatever. The second we can do by writing down, and saying as we write them, words that use the six or seven consonants that we can sound alone, and so can stretch out in time. Thus we could write Sam, saying the *s* as we write the *s*, the *a* as we write it, and the *m* as we write it.

Same with man, fan, van, or mis, or us, or if. It is neither necessary nor a good idea to be too thorough about this. It is not a lesson to be completely learned and digested the first or second time. That is not how children learn things. They have to live with an idea or insight for a while, turn it around in some part of their minds, before they can, in a very real sense, discover it, say "I see," take possession of the idea, and make it their own—and unless they do this, the idea will never be more than surface, parrot-

learning, and they will never really be able to make use of it.

Then, as children slowly take possession of these ideas about reading, we can introduce them to more words, and so more sounds, and the connection between the words and the sounds. While there are books such as the one I mentioned earlier (*Let's Read*) that List all of the one-syllable words that can be made from different combinations of consonants and vowels, it wouldn't take parents very long to make such lists for themselves— bat, fat, cat, rat, and so on. There is no need for such lists to be complete, just long enough to expose the child to the idea that words that look mostly alike will probably sound mostly alike.

In any case, hardly any children will want to spend much time with what are so obviously teaching materials. They will want to get busy reading (and writing) real words, words in a context of life and meaning. No need to talk here about ways to do that— people who read this are sure to have any ideas of their own. If we read and write, the children will want to; if we don't, they won't.

1.8.9 Mistake of focussing too much on definitions – many of which are inconsistent and incorrect

Another very common school mistake is to ask children to learn and memorize which letters are vowels and which are consonants. Schools usually do this by trying to teach the children some definitions of "vowel" and "consonant." These definitions are almost always inconsistent and self-contradictory, such as "A vowel is a sound that you can say all by itself". As I have said, this is equally true of some of the consonants. I have thought about this from time to time, and have never been able to think of a definition of vowels and consonants that was clear, distinct, and allowed no exceptions.

In any case, this is a bad way to teach children anything. **They think best (as I suspect we all do) when they can move from the particular to the general.** Beyond that, there is no good reason why children learning to read should learn the words "vowel" and "consonant." Knowing or not knowing those words has nothing whatsoever to do with reading.

1.8.10 A phonics game that might be useful

I have written elsewhere about playing a game with children in which they ask me to write a word, and I write it. Next time I do this, I may use one colored pen to write the consonants, and another to write the vowels. Though I can imagine that some children, suspecting that I was trying to sneak in some teaching, might tell me not to do even that.

A better variation of that game might go like this. We could write each letter on a separate card or piece of paper, vowels in one color, and consonants in another. Then we could say to the child, "Put together any two, or three, or four (or more) of these cards, and I will tell you what they say." If the child gave us bsrx, we could do our best to make those sounds. The child would begin to notice after a while that the only combinations of letters that made sounds that sounded like the words he heard around him were the ones that had both colors in them, and that these were very often in the form of consonant-color + vowel-color + consonant-color. If he ever asked, "What do you call this kind of letter, and what do you call this kind?"

(I can't guess whether a child would be likely to do this), I would say, "We call these kinds of letters 'vowels' and these consonants." (If he asked why, I would tell him I didn't know.)

None of these tricks or games is necessary or will help a child to read faster or better. But for people who for whatever reasons feel they want to do something, I suggest these as things that might be fun (for both adult and child) to do, and, as long as they are fun, possibly useful, and probably not harmful.

1.9 HOW NOT TO LEARN TO READ

1.9.1 Pathway to learning to read reduces significantly when there is a strong interest to read something

Leon, a young black man of about seventeen whom I met some years ago in an eastern city, was a student in an Upward Bound summer program.

He was at the absolute bottom of all his regular school classes, tested, judged, and officially labeled as being almost illiterate. At the meeting I went to, the students - some black, some white, all poor - had been invited to talk about their summer school and what they could remember of their own school experiences and how they felt about them. Until quite late in the evening Leon didn't speak. When he did, he didn't say much. But what he said I will never forget. He stood up, holding before him a paperback copy of Dr. Martin Luther King's book *Why We Can't Wait*, which he had read or mostly read, during that summer session. He turned from one to another of the adults, holding the book before each of us and shaking it for emphasis, and, in a voice trembling with anger, said several times at the top of his lungs, "Why didn't anyone ever tell me about this book? Why didn't anyone ever tell me about this book?" What he meant, of course, was that in all his years of schooling no one had ever asked him to read, or ever shown him or mentioned to him, even one book that he had any reason to feel might be worth reading.

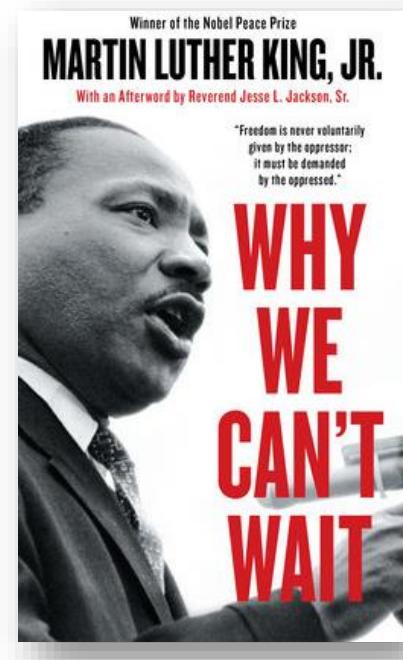


Figure 7: Title of the book 'What We Can't Wait'

"*Why We Can't Wait*" is a moving account of the struggle for civil rights in segregated Birmingham, Alabama, and an assessment of the work ahead to bring about full equality for African-Americans. Dr. King offers an analysis of the events that propelled the Civil Rights movement to the forefront of American consciousness. "*Why We Can't Wait*" is an enduring testament to the wise and courageous vision of Martin Luther King, Jr.

Martin Luther King, Jr. (January 15, 1929 - April 4, 1968) was a famous leader of the American civil rights movement, a political activist, and a Baptist minister. In 1964, King became the youngest

man to be awarded the Nobel Peace Prize for his work as a peacemaker, promoting nonviolence and equal treatment for different races. On April 4, 1968, Dr. King was assassinated in Memphis, Tennessee. In 1977, he was posthumously awarded the US Presidential Medal of Freedom.

It's worth noting that *Why We Can't Wait* is full of long intricate sentences and big words. It would not have been easy reading for more than a handful of students in Leon's or any other high school. But Leon, whose standardized Reading Achievement Test scores "proved" that he had the reading skills of a second-grader, had struggled and fought his way through that book in perhaps a month or so. The moral of the story is twofold: that young people want, need, and like to read books that have meaning for them, and that when such books are put within easy reach they will sooner or later figure out, without being taught and with only minimal outside help, how to read them.

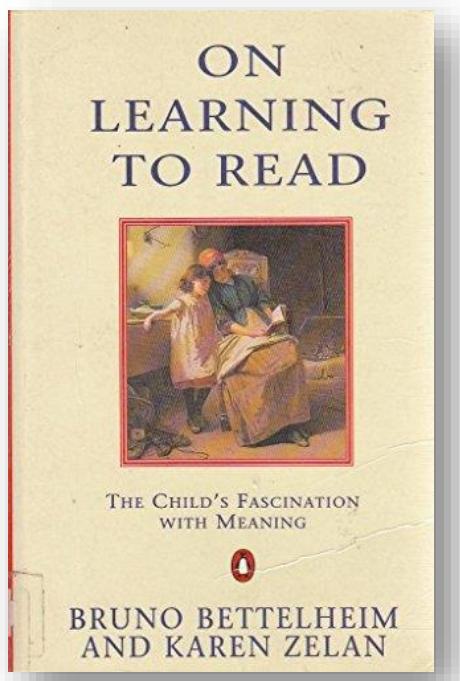
1.9.2 The epidemic of boring books and readers for children

In their book *On Learning to Read*, Bruno Bettelheim and Karen Zelan understand well and state eloquently the first half of this moral, but not the second. They argue about ways to improve the teaching and miss the far more important point, that any teaching that the learner has not asked for is likely to impede and prevent his or her learning.

But in this, I may misjudge them. Bettelheim is a most astute and realistic man, and it may be that, understanding the unwillingness of schools to make even simple changes in their ways of doing things, especially where doing this might require giving up the illusion that they can create and control all the learning of all the children, he and his colleague made a tactical decision to accept as given almost everything in the philosophy, organization, and practice of schools, and to concentrate their attention on two very limited targets: the abysmal lack of quality of the basal readers used in schools and the destructive ways in which teachers customarily respond to the mistakes children make when they read aloud

in class.

With the first of these issues, they are right on target. The books that most children are compelled to learn to read from are beyond belief boring,



*Figure 8: Title of the book 'On
Learning to Read'*

stupid, shallow, misleading, dishonest, and unreal. The figures alone tell the story: [The] first readers³ published in the 1920s contained on average 645 different words. By the 1930's... about 460 words. In the 1940s and 1950s... about 350 words. [In] seven basic readers series published between 1960 and 1963 ...primer vocabularies [ranged from] 113 to 173 words... In 1920 the number of running words per average story [in Scott, Foresman primers] was 333, by 1962 it had shrunk to 230... The number of different words used in the entire book was 425 in 1920, 282 in 1930, 178 in 1940, and 153 in 1962.

Wondering why publishers keep restricting the vocabularies of their books, the authors say:

One possible explanation... is that as the readers became more boring,

³ I.E. the books which the kids were made to read to improve their reading

children learned to read less well. The conclusion drawn from this fact was not the obvious one that as textbooks became more boring to children and teachers alike, children would have a harder time working up an interest in learning to read. Instead, it was concluded that the books were too difficult for the children and that things should be made easier for them, by asking them to learn fewer words! So each new edition of a primer contains fewer words in ever more frequent repetition, and in consequence, is more boring than that which preceded it... As this cycle continues up to the present day, things have gone from bad to worse.

The badness of these readers is indeed a worthy target and may prove a vulnerable one. If only because it makes this point so strongly, Bettelheim and Zelan's hook is well worth reading. And if to any degree it succeeds in reversing the downward cycle described above, and making readers more challenging, varied, interesting, and real, it will have been well worth the writing.

1.9.3 How to understand the reading mistakes made by children

The largest part of *On Learning to Read* deals with the meanings of children's mistakes. The authors assert that it is wrong to assume that these mistakes are the result of ignorance and carelessness and that the teacher's job is to correct them as quickly as possible while criticizing or chastising the child for making them. Bettelheim and Zelan argue that these mistakes almost always have important meanings for children. Teachers, they say, should understand this and let children know they understand. Beyond that, teachers should whenever possible figure out these hidden meanings and make them visible to the child, a process that suggests a kind of instant psychoanalysis.

Being experienced psychoanalysts themselves, Bettelheim and Zelin are dazzling ingenious at intuiting or ferreting out these hidden meanings. Do they never guess wrong? At least in the examples they cite, their understanding does indeed help the children to correct their mistakes, cope with their anxieties, make more sense of the text, and so progress in their reading. But Bettelheim and Zelan urge all teachers of reading to

follow their example and use this method. I am not at all in sympathy with this part of their proposed remedy for the reading problem.

Paying such extraordinary attention to reading mistakes does work, but it seems roundabout, difficult, and in the end an unworkable solution to a problem that would not exist if the schools had not created it. Very few teachers are likely to be able to respond to children's mistakes in the patient, respectful, and thoughtful way Bettelheinl and Zelan propose. They haven't the time, the training, and inclination, or, above all, the inherent sympathy and respect for children on which such work would have to rest. Indeed, I fear that in the unlikely event that the schools took this proposal seriously, the results would do more harm than good. There is far too much pseudo-psychologizing and quack diagnosing of children in our schools as it is.

In any case, the problem this proposal aims to solve is wholly unnecessary. If teachers would only stop making children read aloud in class, they would not need to worry about how to respond to their mistakes. And, even more important, if children were allowed to read privately and for their own pleasure, they would soon catch and correct most of these mistakes themselves.

1.10 HOW NOT TO LEARN TO WRITE: WITH BIG BIRD

1.10.1 The problem with Sesame street

From the point of view of education, learning, instruction, much of what I have seen on "Sesame Street," in the dozen or more times I have watched it, seems to me to be clumsy, misleading, and just plain wrong; typical of the worst things done in schools. This is a great pity. "Sesame Street," for example, puts great stress on the alphabet and on learning to count to ten or, more recently twenty.

What we must do in helping anyone learn to read is to make very clear that writing is an extension of speech, that beyond every written word there is a human voice speaking, and that reading is the way to hear what those voices are saying. Like the schools, "Sesame Street" far too often

blurs and hides these truths. That is all the more unfortunate because the TV can make the point more clearly and vividly than a teacher in a classroom.

1.10.2 The benefit of on-screen text

Suppose that children were to hear a voice speaking and at the same time see the words, as they are spoken, appearing in print. Cartoon figures and the Muppets could have word balloons over their heads, as in comic strips, a convention that many children already know; even when live figures are speaking, the TV screen could be split, with the words appearing at the side – a Tele-Prompter in reverse.

This feature is fortunately available now on youtube and so on. If used correctly, it can become a good source of learning for children.



Figure: Some characters from Sesame Street

1.10.3 Example of an incorrect way to teach spellings

Here is an example of something done extremely badly that might have

been done well. Big Bird was standing by a wall on which he had put the letters OVEL. An adult came up, and Big Bird began to rhapsodize about the word he had put up, which he meant to be love. The adult told him that he did not have the word love on the wall, and as they discussed this, said that Big Bird's OVEL "did not spell anything". This statement could not be more false, or misleading, or damaging. The letters OVEL do spell something. They spell a word that anyone who can read can pronounce. The word doesn't happen to mean anything, but that is something else. Surely we have gotten past the *Dick and Jane* idea that you aren't reading a word unless you know its meaning.

Dick and Jane are the two main characters created for a series of basal readers written by William S. Gray to teach children to read. The characters first appeared in the Elson-Gray Readers in 1930 and continued in a subsequent series of books through the final version in 1965.



Figure 9: A sample page from the Dick and Jane series

But then followed something worse. The adult began to say, in that typical teacher condescending-explaining, how-could-you-be-so-stupid voice,

"But, Big Bird, you've put the L after the word, and you should have put it before it." She said this several times as if it were self-evident that "before" meant "on the left side" and "after" meant "on the right side," and as if all she needed to do to make this clear was to say it often enough. In fact, there is nothing self-evident or natural, or reasonable about it at all. We just do it that way. **But nothing makes school more mysterious, meaningless, baffling, and terrifying to a child than constantly hearing adults tell him things as if they were simple, self-evident, natural, and logical, when in fact they are quite the reverse— arbitrary, contradictory, obscure, and often absurd.** Eying directly in the face of a child's common sense.

What might have been done instead? Here is one scenario. The adult reads OVEL aloud, "Oh-vell, oh-vell." He says, "What does that mean, Big Bird?" Big Bird says the word says "love." The adult insists it says "oh-vell." As other people come up, Big Bird appeals to each of them. They all read, "Oh- vell." From this, we can see what is very important, that one of the advantages of written speech is that it says the same thing to everyone who can read it... Anyway, after a number of people, adults and children, have told Big Bird that his word says "oh-vell," he says sadly that he wanted it to say "love." Then someone, preferably a child, says to him, "If you want it to say 'love,' all you have to do is put this L here." No nonsense about "before" and "after." Just move the letter. Then perhaps the child might say the word love slowly, moving his fingers under the letters matching the sounds. Big Bird might then say, "Oh, I see; the letters go that way." Note that even Big Bird's mistake, unlike most of the mistakes of children, was nonsensical. There would have been some reason to put EVOL on the wall, but not OVEL.

What is vital here, and in all reading, is the connection between the order in time of the sounds of the spoken word and the order in space of the letters of the written one. If so many children have trouble discovering this connection, it is because in most reading instruction we do so much to hide it— and this is no less true of the methods that, like "Sesame Street," make a big thing out of "What letter does the word begin with?"

1.10.4 Example of an incorrect way to teach sounds of letters

On a program presented one day on the letter x, another opportunity was lost. An animated-cartoon narrator was trying to think of words that ended with x. First, a fox went by, and the voice said "fox" but the letters FOX did not appear on the screen. Then other words box, ox, ax – with appropriate and clever pictures to match, but still no letters. Instead, we might have shown what Caleb Gattegno calls "transformations," the way the sound of a word changes when we change a letter in it - and it is making such transformations, not sounding out a word letter-by-letter, that good readers do when they meet words they don't know. Thus, beginning with FOX, we might have moved away from the F and brought in a B to make BOX, then removed the B to leave OX, then changed that to AX, and from there to TAX. We might then have brought in an O to make TOX. Here the cartoon narrator could have looked puzzled. "Tox! Tox!" he might have said. "I don't think there is any word such as Tox. It is a nonsense word; some words you can say and write don't mean anything." Perhaps then a few more nonsense words. Perhaps a bit of business of looking up a word in a dictionary to see whether it has a meaning. Then perhaps back to FOX and from there to FIX.

1.10.5 Capital and small letters

As opposed to "capital letters," and in place of the exact word "lowercase," the show follows school in talking about "small" letters. This is nonsense. Whether a letter is a capital or not has nothing to do with size, but with shape. Indeed, the point should be made that a letter, capital or lowercase, can be as small or large as we care to make it. We might show writing on the head of a pin, big letters on a blackboard, children writing letters in the snow, skywriting.

A capital A is shown. A voice says that it is like an upside-down V with a line across. So far, so good. But why not show all the ways in which we can deform or change an A without losing its A-ness – make it taller, shorter, thicker, or more slender in the strokes, slanting left or right, and so on. Why not, with film clips, show children many different shapes of

A's in real life? Why spread the false and absurd notion that there is only one way to make an A? Why not show children making many different shapes of A's?

1.10.6 Some useful techniques for parents and teachers:

We might also find ways to reveal to children that all the writing they see around them began as someone speaking. With compressed time we could show very vividly the transition from spoken words to words written on signs or posters, where a great many people could see them. We might show a number of ways to write things, with pencil or pen or felt-tipped pen or typewriter, with ditto or mimeo, with printing, with electric signs, even with skywriting. We could show children tricks by which they could teach themselves to write.

In still other ways we could make dear to the children that writing is an extension of powers they already have, and that they, got for themselves: namely the powers of speech. We should constantly remind them that they figured out for themselves how to understand and talk like all the bigger people around them, and that learning to write and to read writing is easy Writing is a kind of magic or deep-frozen speech, which the writer can use, day after day, to say to everyone who looks at it whatever he wants to say. It is an extension of the voice of the speaker, and since children sense their littleness and want to be larger and more potent, the idea that through writing they can make their voices reach much farther could be very exciting to them.

1.11 SPELLING

1.11.1 What good and bad spellers do

The best way to spell better is to read a lot and write a lot. This will fill your eye with the look of words, and your fingers with the feel of them. Good spellers do not look many words up in dictionaries or memorize spelling rules. When they are not sure of how to spell a word, they spell it several ways and pick the one that looks best. In almost every case it turns out to be right.

1.11.2 How to improve spelling

People who spell badly— I have taught many of them— are not much helped by rules and drills. In all my work as a teacher, nothing I ever did to help bad spellers was as effective as not doing anything, except telling them to stop worrying about it and to get on with their reading and writing.

People who already spell somewhat badly would probably spell better if they taught themselves to type. Learning to type would make them look more carefully at words, and, as they concentrated on hitting the right keys they would, so to speak build the proper spelling of these words into their fingers. It is often easier to build a new and correct habit into our neuromuscular system than to get an old incorrect one out.

1.11.3 A useful exercise to improve spellings

But many will not agree with this, and will still insist that people can improve their own, or their children's, spelling by some kind of practice, drill, or testing. For them, here is a self-test for spelling, which enables students to keep track of which words, they know and which they don't, and to work on the ones they don't.

On one side of a card, we can print the word itself. Then, on the other side of the card, we need something to tell us what the word is without actually showing us the word, which would of course defeat the point of the test. I propose that we write each word on one side of a card, and on the other side write either (1) a picture that will tell what the word is and/or (2) a sentence or two in which the word is used, but the word itself is left blank.

Thus, to take a very simple example, a child writing a card for the word horse would write HORSE on one side (perhaps both in capitals and lowercase letters), and on the other side would draw a figure of a horse, or perhaps stick on a picture taken from a magazine. The child might also write a sentence about a horse, like "I want to ride a —", or "My — eats hay," or "A colt is a young," and so on. It is important that those who will

use the card draw the picture and or make up the sentence(s); that way, they are much more likely to remember.

Then when the time comes to test themselves, the students can put the cards down, picture-side-up, take 1 card look at the picture and read the sentence, figure out what the word is, spell it on another piece of paper, and then turn the card over to see whether they were right. The "right" cards could be put aside in one stack the "wrong" cards in another. It would probably be good for students to go through their "wrong" cards again at the end of the test. The students themselves would decide how many words to try. People who are anxious about spelling would probably do better not to test themselves too long at a time. And it would probably be a good idea, whenever there got to be as many as, my five cards in the 'wrong' stack for students to retest themselves on them before going on with other words.

Many words don't make pictures. Take "necessary," which many people misspell. In that case, on the reverse side of the card, instead of a picture, write something like "That's ne_____y; I really need it." That will be enough to tell you what the word is, without giving away how to spell the hard part of the word. For "separate" you might write, "Don't put them together, keep them se_____ "

What is crucial in all this is that the students be in control of this testing and checking process. Just as it is better to let children make their own pictures, so it's better to let them make up their own definitions or examples; the ones they makeup, they'll remember.

However useful this self-test might be, I beg, urge, and plead that you do not do any of this with children just starting out to read and write. As I said, if they do plenty of reading and writing for pleasure, their spelling will improve as they get more and better word images in their minds. I would use this method only with children who had already become quite bad spellers.

One more question: Where would this list of words come from that the children would make up cards for? From one place only - misspelled

words in their own writing. There could be no greater waste of time than asking children to learn to spell words that they are not using.

This method would work just as well for adults.

1.12 HANDWRITING

1.12.1 *A myth about teaching cursive writing*

When I was little, I was taught cursive handwriting, found it easy and pleasant to do, and soon developed a small and fairly neat handwriting that, at least when I am being careful, has not changed much to this day.

Teaching fifth grade, and seeing many students with slow, tortured, scrawly, irregular "cursive" writing, I began to wonder why the schools insisted on teaching cursive. Still believing then that schools had good reasons for everything they did, I decided it must be because cursive writing was so much faster than manuscript printing. Since my own handwriting, particularly when I was using it a lot, was very small and fast, I could easily believe this. Secretly I thought that probably very few people could write as fast as I could.

One day in fifth grade I told my students about, "The quick brown fox jumps over the lazy dog," the famous typing sentence (one of many, I later learned) that contains all the letters of the alphabet. I asked them to see how many times they could write it in a half-minute, which I timed with a stopwatch. After each trial, they counted up the number of words they had written, to see how much they improved with practice. We did a number of things like this in the class, in which students competed not against others but themselves, trying to break their own records. The children enjoyed these contests in which, since everybody improved, everybody won. They fell to work with a will on "the quick brown fox" as I did, sitting at my desk, racing along with my tiny handwriting.

When I began walking around the room looking at my papers, which the children eagerly stuck in my face to show their improvement, I received a shock. Three of them could apparently write faster than I could, even

though they used manuscript printing, one sloppily but two quite neatly. I thought, "This can't be right, there must be a mistake somewhere, I must have counted wrong; these ten-year-olds can't possibly write the manuscript letters faster than my itty-bitty super-speedy cursive." I proposed we write some more quick brown foxes. They gladly agreed. Back at my desk, I made my pen fly. This time we would see! Alas, the results were the same — I was still the fourth fastest writer in the class. (Did I confess? I don't remember.)

So why do we teach and demand cursive writing in schools? I have no idea. Pure habit, I guess. In the words of the old song, "Do, do, do what you done, done, done before." Later I learned that school cursive, called in my day Palmer penmanship⁴, had evolved from an elaborate decorative script invented for engraving in copper, a very slow and painstaking form of writing that had nothing to do with speed. Someone, somewhere, decided that it would be nice if children learned to write like copperplate engraving and the rest, as they say, is history.

The other day I decided to test these two types of writing myself, to see whether I could write faster in cursive or in the modified italic manuscript print that I sometimes use to write little notes in my office. I found to my

⁴ The Palmer Method of penmanship instruction was developed and promoted by Austin Palmer in the late 19th and early 20th centuries. The Palmer Method soon became the most popular handwriting system in the United States. Under the method, students were taught to adopt a uniform system of cursive writing with rhythmic motions. Palmer's method involved "muscle motion" in which the more proximal muscles of the arm were used for movement, rather than allowing the fingers to move in writing. Proponents of the Palmer Method emphasized its plainness and speed, that it was much faster than other methods. In the class experiment conducted by John Holt, this was proved to be wrong. The Palmer Method began to fall out of popularity in the 1950s and was eventually supplanted by the Zaner-Bloser method, which sought to teach children manuscript before teaching them cursive, in order to provide them with a means of written expression as soon as possible, and thus develop writing skills. The D'Nealian method, introduced in 1978, sought to address problems raised by the Zaner-Bloser method, returning to a more cursive style. The Palmer company stopped publishing in the 1980s.

surprise that though I have been using cursive writing all my life, and until making this test had been doing much more writing than printing I could print faster than I could write. The difference was not very great, but it was consistent. No matter how much I warmed up and practiced my cursive, I could never make it as fast as my printing.

Why should this be so? The only reason I can think of is that when we move from the end of one letter to the beginning of another, we can move our pen a little bit faster through the air than across the paper, partly because the paper slows down the pen a tiny bit, and partly because when we move our pen through the air we don't have to worry about what the joins or connections between the letters look like.

So, at the tender age of fifty-seven, I am going to drop cursive (except for my signature) and do all my pen and pencil writing in my modified print. Since it is both faster and more legible, why not? Why, in general, is print more legible than cursive writing? Or, to put it a little differently, why are unjoined letters easier to read than joined?

Because there is no possibility of confusing the joins (*ligatures*, as one italics book calls them) with the letters themselves. This is one of the main problems of most illegible handwriting; you often can't tell whether a particular mark on the paper is part of a letter or only a joint between letters.

So now we have two solid and convincing reasons for resisting if we want to, the demand of the schools that our children learn cursive writing print is more legible and is demonstrably faster. Of course, if children want to learn cursive writing because they like the way it looks, or because they see some grown-up doing it, they can. But there is no sensible reason to make them.

1.12.2 Should pen-strokes and shapes of alphabets be specifically taught?

Only a few basic shapes and pen strokes are needed to make letters, and all these pen strokes are easily and quickly made by the hand and fingers.

On the whole, I see no reason to make children waste time practicing these shapes. If they write, as they speak in order to say things they want to say to people they want to say them to, and if they have good models of printing to look at, they will improve their writing just as they improve their speech. A possible exception - children who have learned to write cramped, awkward, illegible cursive may need a little practice on shapes just to loosen up their hands and give them the feeling that printing can feel as well as look good.

But I wouldn't push this if a child resisted, preferring to write real writing: that is, writing meant for others to read.

1.13 CITIZENS IN THE WORLD OF BOOKS

This section presents a comparison of two perspectives of how children get introduced to reading – either by playing with words (like lego blocks) and building a structure from them, OR pondering over an already built structure and then gradually filling in the details of how that structure was made.

As I write this, Helen (ten months old) is sitting in the doorway to my office with a paperback book, *The Land of Oz*, in her hands.

She is having a fine time with it. For her, it is mostly a shiny rectangular object, just thick enough to get a good grip on and wave around, except that because of its shiny cover it slips out of her hands easily and lands every so often with a nice thump on the floor. Now and then she will get hold of it by the cover alone, but she has not discovered, for the most part, that a book is made up of a lot of separate thin pages that can be turned, torn, crumpled, looked at, or whatever.

First issued in 1904, L. Frank Baum's *The Marvelous Land of Oz* is the story of the adventures of the young boy named Tip as he travels throughout the many lands of Oz. Here he meets with our old friends the Scarecrow and Tin Woodman, as well as some new friends like Jack Pumpkinhead, the Wooden Sawhorse, the Highly Magnified Woggle-Bug, and the amazing Gump. How they thwart the wicked plans of the evil witch Mombi and overcome the rebellion of General Jinjur and her army of young women is an interesting story.

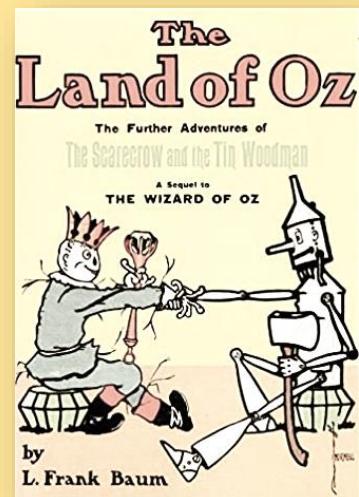


Figure 10: Title of the book, *The Land of Oz*

Just yesterday, her sister Anna (three) was sitting in a big armchair holding a book *A. J. Wentworth, BA*, from which she was reading to her mother, Mary, seated beside her. What Anna was saying sounded very much like reading; she had a reading "tone" in her voice. But the words, instead of having to do with *A. J. Wentworth*, were all about the adventures of some imaginary friends of hers. Seeing me looking at her from the doorway, Anna interrupted herself to say something like "I'm reading this book to Mama and I'm reading the words." I said, "Yes, I can hear that," and after listening a bit more, went on about my business. Later, Mary told me that quite often Anna would stop "reading" right in the middle of a sentence of her story, turn the page,

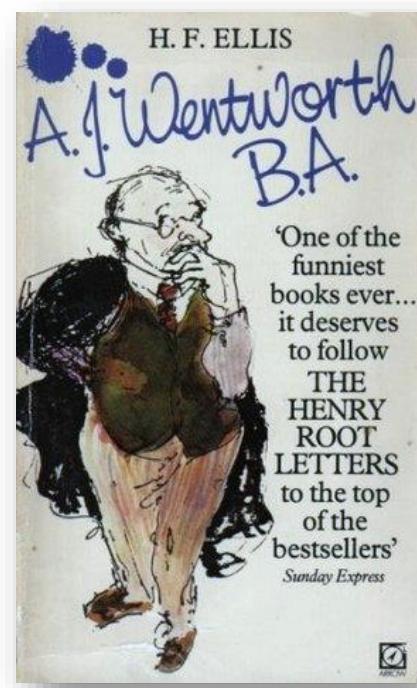


Figure 11: Title of the book *A. J. Wentworth, BA*

and go on, just like someone really reading from a book.

Watching and listening to her, and watching her baby sister today, made me realize there are two diametrically opposite ways of opening to children the world of books. One way is to start them with the names and sounds of individual letters, then with small words, then with small groups of these words joined to make small sentences, then with small reading books, and then other books, each a little harder than the one before, until the children supposedly have enough reading skills to read any book they want. The trouble is that by this time most of them wouldn't care if they never saw another book in their lives. Gaining entry into the world of books this way boils down to surmounting a long row of obstacles, each a little larger than the one before, or going through a series of locked doors that open only when you say the correct password, only to lead you, of course, to still another locked door.

The other way of opening the world of books to children is the way it has been done for Anna. The world of books was first opened to her, she became a citizen of it, when for the first time she clutched a book in her hand and thought, "This book is mine!" Instead of beginning with a tiny idea, the sound of a letter, she began with a big and important one, that books belong to people and could belong to her. In time she filled in this big idea with smaller but still large ideas:

- **that books have stories locked in them,**
- **that they have written words in them, and**
- **that the stories are somehow contained in the words, so that somehow figuring out the words is the key to unlocking and taking possession of the stories, and**
- **that these stories can be shared with, given to, other people.**

Your conventionally taught child, even when much older than Anna, may know nothing of books except how to figure out what the words say. Anna knows everything else about books, including all the important

things.

It is important to note that the discussion in this chapter only relates to learning the first language (or the mother tongue). However, in certain situations (e.g., in the case of immigrants; or for religious reasons), adults and children are required to acquire a second or third language too. The book does not provide any guidelines about that in my understanding. However, some of the following statements from the book '*The First 20 Hours: How to Learn Anything... Fast*' by Josh Kaufman sheds some light on the topic of second language acquisition.

*Like many high school students in the United States, I studied a foreign language. Every school day for four years, I sat in a Spanish class. My marks were high: straight A's. Today, aside from saying *hola*, *cómo estás*, and *muy bien*, I can't hold a conversation with a native Spanish speaker to save my life. (I don't even know what to say if I'm not having a good day.)*

On the other side of the spectrum, my friend, Carlos Miceli, grew up speaking Spanish in Argentina. In high school, Carlos decided he wanted to speak fluent English, so he made an effort to strike up as many conversations as possible with native-English speakers. In the process, he discovered Skype and set up his own website, so he could practice speaking and writing English regularly.

Carlos never took a class. He doesn't know the formal rules of English grammar. He can't even tell you how he knows English. That isn't really important. He can speak and write English fluently, which is what really matters.

Dr. Stephen Krashen, of the University of Southern California, is an expert in the area of second language acquisition. One of Krashen's primary insights is that language acquisition is different from language learning.

In school, I learned a lot about Spanish. I learned thousands of

vocabulary words, verb conjugation, and the rules of grammar. I learned all of these things well enough to pass the tests with flying colors. Those tests, however, had nothing to do with my ability to exercise the skills of speaking Spanish intelligibly and understanding a native speaker talking at full speed. If my goal was to be able to speak Spanish fluently, a few weeks of trying to converse with people in Spanish would've produced better results than four years of schooling.

At that time, speaking Spanish fluently wasn't my goal. I just wanted to ace the final exam. Carlos, on the other hand, skipped the classroom and simply started practicing. Instead of doing verb conjugation drills, Carlos was practicing what really mattered: communicating with other people in English. In terms of effectiveness and long-term value, Carlos's approach was far superior to mine. No contest.

Another useful excerpt from the book is as follows:

Early research is one of the best ways to identify critical subskills and ideas, but it's also very likely you won't know what they mean yet. The meaning comes later, once you've started practicing. Dr. Stephen Krashen, the language acquisition expert I mentioned earlier, calls this comprehensible input. By default, the new information you're consuming isn't very comprehensible, since it's not connected to anything you know or have experienced. Over time, the same information will become comprehensible once you have some experience under your belt. In the words of renowned yoga teacher T. K. V. Desikachar: "The recognition of confusion is itself a form of clarity."

Noticing you're confused is valuable. Recognizing confusion can help you define exactly what you're confused about, which helps you figure out what you'll need to research or do next to resolve that confusion.

The author also points out: *If you're learning common vocabulary words in order to acquire a new language, spaced repetition and reinforcement is valuable.*

The 80/20 rule (or a slightly different percentage) can be seen from the statement below: *Human languages, including English,*

follow a power law curve called Zipf's law: a very small set of words makes up the vast majority of actual usage. Based on an analysis of The Brown Corpus (1964), a 1-million-word collection of 500 modern English documents, only 135 words account for 50 percent of all English usage.²¹ The word "the" itself accounts for 7.5 percent, while "of" accounts for 3.5 percent.

CHAPTER TWO

2. AT HOME WITH NUMBERS



I suspect that many children would learn arithmetic, and learn it better if it were illegal.

This chapter presents a revolutionary way of teaching mathematics. Parents and teachers can learn a lot from the theoretical as well as practical aspects covered in this chapter.

John begins the chapter by explaining the mistakes we do in ‘teaching’ children how to count. Our approach confuses them significantly. The solution to this is not to introduce numbers as some individual entity but explain them concerning something, e.g. 3 apples, and then take away one apple and let them know that they are now 2 apples. In this regard, order is not necessary. Some practical games to facilitate this learning have also been suggested in the chapter. The concept of addition and subtraction is then introduced and emphasized that kids should not be thrown at with useless jargon. They should be able to understand and discover the numbers rather than memorize certain math rules.

I am highly impressed by some simple and cost-effective suggestions mentioned in this chapter. Any home and school-based educational system can easily adopt them. One such example is a home-based adding machine using two rulers. Every child should be allowed to experiment with adding in such a manner rather than being confused with the way the addition

problems are currently presented to kids.

One of the most inspiring aspects in this chapter is the grid that John proposed for mastering 'tables'. This sort of approach will certainly keep children interested and not let 'memorizing' tables be a problem for them anymore. When they complete the grid themselves, they will make numerous observations from it and make several relations that cannot generally be made while memorizing the tables in the manner that we currently do.

Another important game that a lot of children play on their own can be brought into the mainstream – the game in which one child thinks of a number in his head and the other child is able to guess it. A lot of kids do not understand how and why it could happen. If this game is played in the class to increase curiosity in children and then explained to them (so that they can practice it with their parents or other people they know), they would learn a lot from it. They should also be encouraged to form new innovative versions of this game. This would really make things easy for them as far as basic mathematical operations are concerned.

In addition, John re-emphasizes his opinion that he has expressed at several places in this book that learning should be linked to real-life situations. To strengthen their maths and economics skills, they should be involved in managing the finances of home or an event or a particular aspect of the home budget. That sort of approach will uncover the realities and constraints of the world of adults to them and they will question certain assumptions, propose innovative solutions, learn from the approach of elders, and gain a lot during the process.

2.1 COUNTING

2.1.1 *The problem in how we teach counting to the young ones*

When my niece was four or five, her older brothers and sisters taught her

to count, "Sesame Street" style, by having her recite the names of the numbers in order. I heard her say, "One, two, three, four, seven, six, eight" at which point I heard the indignant voices of a couple of the other kids saying to her, "No! No! Seven comes after six!"

It occurred to me then, and many times since, that from such talk children could get a very strange notion about numbers. They might see them as a procession of little creatures, the first one named One, the second named Two, the third Three, and so on. Later on, these tiny creatures would seem to do mysterious and meaningless dances, about which people would say things like "Two and two make four." It seemed likely that any child with such a notion of numbers could get into serious trouble before long, and this did indeed happen to my niece. Some years later I asked several adults who themselves had always been hopeless in arithmetic what they thought of this notion of mine, and many of them laughed and said that this was indeed the feeling they had always had about numbers and was part of the reason why they had always had such trouble with them.

For this reason, it seems to me extremely important that children not be taught to count number names in the absence of real objects. No doubt first-grade teachers like to have their children able to say, "One, two, three," but this ability has nothing necessarily to do with an understanding of numbers.

2.1.2 A better alternative: Introduce the numbers as adjectives

To put it differently, when little children first meet numbers, they should always meet them as adjectives, not nouns. It should not at first be "three" or "seven," all by itself, but always "two coins" or "three matches" or "four spoons" or whatever it might be. There is time enough later, probably much later, for children to intuit the notion that the noun "five" is that quality that all groups of five objects have in common.

2.1.3 Order is not necessary

I would say, too, that it is not at all necessary, and indeed not a good idea, to have children meet numbers always in the counting order. Thus, we

might at one moment show a child two of some kind of object, but the next thing we show, according to the circumstances, might be five of some other object, or eight, or whatever. Numbers exist in nature in quite random ways, and children should be ready to accept numbers, so to speak, where they find them.

2.1.4 Some games to facilitate learning to count

Cards with various patterns:

It would also be helpful, at least some of the time, to have children see, and in time learn to recognize, some of the smaller numbers, probably everything smaller than ten, by the sorts of patterns they make. Thus, a child shown three small objects might on one occasion see them in a row, on another, see them arranged in a triangle. Four objects could be shown, either arranged in a square, or in a row of three with another one on top. The patterns for five could be a regular pentagon, or a square with another one on top, as in the manner of a child's drawing of a house, or perhaps a square with another object in the center. Six we could show in two rows of three, or a triangle with a row of three on the bottom, then two, then one, or perhaps in other ways. Such patterns might be put on cards, perhaps with the number symbol or digit of the card on the other side. I'm not for one moment suggesting that children should be forced, or even encouraged, to memorize these cards. But if such cards were available for children to see and play with in various ways, perhaps to play matching games which they might intuit and in a short time come to learn these relationships. It seems to me important for a child to have ways other than counting to identify small numbers.

Domino game:

In this connection, a set of dominoes might be a useful toy, and indeed I would guess that quite young children would enjoy playing dominoes even if they could do no more than match patterns with other patterns. Questions of scoring could come in later.

Dice-based games that do not contain any inappropriate things can also be an option. For example, the game LUDO might be useful. It can not only show them number counts (and enable their quick recognition) but also help with counting the moves and plan movements and so on. Snakes and ladders can also be useful.



Figure 12: Ludu board game

2.1.5 Avoid confusion between the name of the object and the size of the group

It also seems to me important that if and when adults are counting objects for a child, that they do not move from one object to the next, saying as they go, "One, two, three." The child seeing the adult touching these items, which in other respects all look exactly alike, and saying a different word for each one, may very well conclude that in some strange way "one, two, three" ate the names of these objects. This confusion can be easily avoided. As we count each item we can move over to one side, saying at the first, "Now we have one", then, we move the second object to it, 'Now we have two," and then in turn, "Now there are three, now there are four, now five," and so on. Thus, at every point, the number name refers not to a particular object but to the size of the group of objects that we have set to one side.

2.1.6 How to introduce cardinal and ordinal numbers

Somewhere along the line, we could introduce the idea of ordinal numbers: that is, the numbers that indicate the place of an item in an array, and not the size of a group of items. Thus, given a row of small objects, we might touch them in turn, saying as we go something like "This is the first one; this is the second one, and the third one, and the fourth one, and the fifth, and the sixth." There is no need at first to talk about such notions as "cardinal" and "ordinal." If we simply use words in a way that reflects the nature of these ideas, the child will in a fairly short time grasp the difference.

2.1.7 Counting in numbers greater than one

When we are counting a number of small objects, there is no necessity that we should always count by ones. We might just as we move two objects over to the side at a time, saying as we do, "Now we have two, now four; now we have six," or in some cases, we might count by threes or fours or whatever gradually getting across to the child that there are many ways of doing this and that we can pick the one that seems most handy.

2.1.8 Importance of the above-mentioned methods in preventing confusions

Some children, of course, grasp these notions of cardinal and ordinal in spite of our rather confusing way of presenting them, and often in spite of our own confusions, but many do not, and I strongly suspect that a great many children might find it easier to understand these distinctions if, when we first introduce them, we use methods such as these.

2.2 ADDITION AND SUBTRACTION

This section explains the painful phenomenon of rote memorization with 'why' and 'how' not being explained. We think from our perspectives and what seems logical to us rather than thinking about the children. The use of complex words and terms only confuses them.

Sometime during first grade, most children will be told and asked to write down and to memorize, that $2 + 3 = 5$. This may be called a "number fact," or an "addition fact," or both. The children will almost certainly be given a list of such facts to memorize and repeat on demand. Their books and teachers will explain and illustrate this fact in different ways, such as showing a picture of two baby chicks, then one of three baby chicks, then one of five baby chicks, or some other "cute" thing that children are supposed to like.

Another "number fact" that the children will be told is that $3 + 2 = 5$. They will almost always hear it as a separate fact, not connected with the fact $2 + 3 = 5$. Some children will wonder why the two number facts come out the same. Once in a great while, one of them will ask why. Some teachers may answer, "They just do, and that's all." Less old-fashioned teachers may reply, "Because addition is commutative." This is just putting a big mystery in place of a little one. Even a child who understood what "commutative" meant might say, "I can see that it's commutative; what I want to know is, why is it?" But children generally don't say things like that; they just slump back in their seats thinking. "One more thing that makes no sense."

Before long the children will be told two new "number facts" or "subtraction facts." One that $5 - 2 = 3$, the other, that $5 - 3 = 2$ Again, they will hear these as separate facts, not connected with each other or with the addition facts they met in first grade. Again, their teachers and textbooks will give various explanations of what subtraction "means." In one "good school" I taught in, there was a near civil war about this. One group of teachers wanted to say that $5 - 3 = 2$ means, or can mean, "What do we have to add to 3 in order to get 5?" This is how people count change in stores—they begin with the amount of your purchase, then add change and bills to it to equal the amount of money you gave them. It is a perfectly sensible method. But the other faction in this school, including the head of the lower-school math department, denounced this "additive subtraction," and told the elementary teachers that they must not use or allow the children's way of thinking about subtraction. He said they must

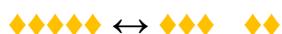
think only in terms of "taking away."

Meanwhile, there are children struggling in the face of growing anxiety (theirs and their teachers) to memorize all these disconnected and meaningless facts, as if they were learning the words to a song in a language they did not know. After a year or so some children become good at parroting back number facts, but most don't know them and never will — they have already joined the giant army of people who "can't do math."

2.3 NONE OF THIS IS NECESSARY

2.3.1 *Understanding addition, subtraction, and splitting as a law of nature rather than arithmetic*

$2 + 3 = 5$, $3 + 2 = 5$, $5 - 2 = 3$, and $5 - 3 = 2$ are not four facts, but four different ways of looking at one fact. Furthermore, that fact is not a fact of arithmetic, to be taken on faith and memorized like nonsense syllables. It is a fact of nature, which children can discover for themselves, and rediscover or verify for themselves as many times as they need or want to.



The fact is this: If you have before you a group of objects coins or stones, for example — that looks like the group on the left, then you can make it into two groups that look like the ones on the right. Or — and this is what the two-way arrow means — if you have two groups that look like the ones on the right, you can make them into a group that looks like the one on the left.

This is not a fact of arithmetic, but a fact of nature. It did not become true only when human beings invented arithmetic. It has nothing to do with human beings. It is true all over the universe. One doesn't have to know any arithmetic to discover or verify it. An infant playing with blocks or a dog pawing at sticks might do that operation, though probably neither of them would notice that he had done it; for them, the difference between

◆◆◆◆ and ◆◆◆ ◆ would be a difference that didn't make any difference. Arithmetic began (and begins) when human beings began to notice and think about this and other numerical facts of nature.

Early in human history, people began to invent special names to talk about that property of a group of objects that had to do only with how many objects there were. Thus, a group of five kittens, a group of five shoes, and a group of five apples have in common only that there are the same number in each group so that for each kitten there would be one shoe or one apple, with none left over. And it is a property of the number 5 that it can be separated into two smaller numbers 5 and 3. It is another property of 5 that it can be separated into 4 and 1. And it is still another property of 5 that these are the only two ways in which it can be separated into two smaller numbers. If we start with 7, we can get 6 and 1, or 5 and 2, or 4 and 3; with 10 we can get 9 and 1, 8 and 2, 7 and 3, 6 and 4, or 5 and 5. Every number can be split into two smaller numbers in only a certain number of ways - the bigger the number, the more ways. (There is a regular rule about this, a simple one, which children— and adults— might enjoy finding for themselves.)

Once we get it clear in our minds that ◆◆◆◆ ↔ ◆◆◆ ◆ is a fact of nature, we can see that $3 + 2 = 5$, $2 + 3 = 5$, $5 - 2 = 3$, and $5 - 3 = 2$, whether we put these in symbols or in words (such as "plus," "added to," or "take away"). They are simply four different ways of looking at and talking about one original fact.

2.3.2 Understanding a simple rule would render useless rote memorization of dozens of math 'facts'

What good is this? The good is that instead of having dozens of things to memorize, we have only four, and those are all sensible. Once children can him ◆◆◆◆ ↔ ◆◆◆ ◆ in $3 + 2 = 5$ or any of the other forms, they can look at any other number, and find out how it may be split into two parts, and then write down all the ways of talking about that.

Thus a child might take ◆◆◆◆◆◆◆, find out by experiment that it could be

split (among other ways) into $\diamond\diamond\diamond\diamond$ and $\diamond\diamond$, and then write down $6 + 2 = 8$, $2 + 6 = 8$, $8 - 2 = 6$, and $8 - 6 = 2$, and then do the same with 7 and 1, or 5 and 3, or 4 and 4. In short, all the number facts that children are now given, and then asked to memorize, they could discover and write down for themselves.

The advantage of the latter is that our minds are much more powerful when discovering than memorizing, not least of all because discovering is more fun. Another advantage is that so much of arithmetic (and by extension mathematics) that now seems mysterious and full of coincidences and contradictions would be seen to be perfectly sensible.

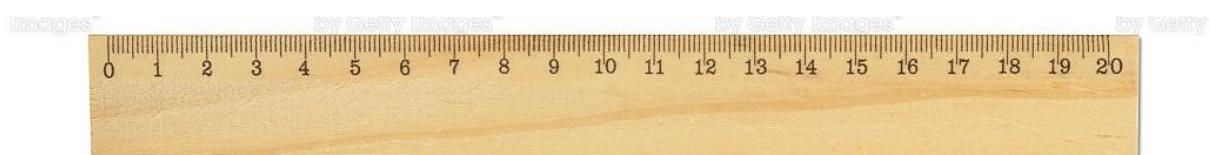
Once, when I talked about this to some teachers, one man said that his school was already teaching addition this way. It turned out that what he meant is that in their textbooks, for every "number fact", $3 + 4 = 7$, for example, there was an illustration of four baby chicks, three baby chicks, and seven baby chides (or whatever). But this completely missed the point I was vying to make, and am making here. $\diamond\diamond\diamond\diamond = \diamond\diamond\diamond\diamond$ is not an illustration of the fact $2 + 3 = 5$. $\diamond\diamond \diamond\diamond = \diamond\diamond\diamond\diamond$ is the fact, and $2 + 3 = 5$ only one of a number of ways of talking about it and putting it in symbols.

2.4 A HOMEMADE ADDING MACHINE

2.4.1 Numerous learnings from a simple adding "machine"

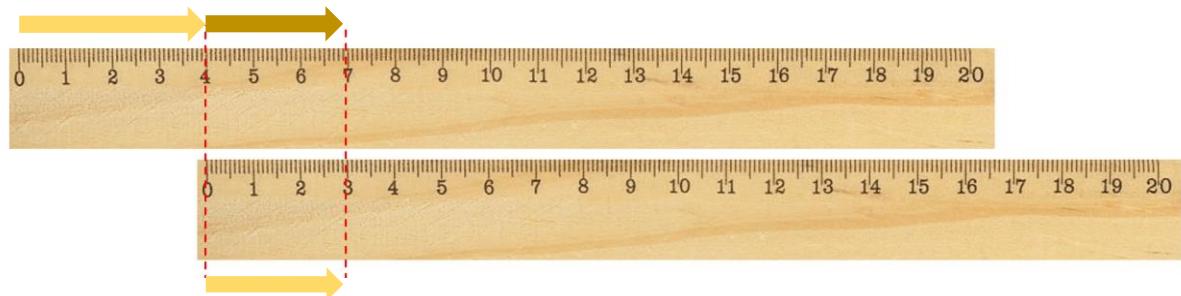
When children are first learning to add and subtract, they don't need anything as fancy as a calculator to help them work more quickly. We can make for children, or show them how to make, a simple adding and subtracting "machine" out of two rulers, or even out of two pieces of paper marked off like rulers.

Suppose we have two rulers or pieces of paper like this:



Here's how we use them to add $4 + 3$:

We put the left-hand end of one ruler against the 4 mark on the other. Like this:



Then we look at the 3 mark on the second ruler, and we see that it is against the 7 mark on the first ruler. This shows us that $4 + 3 = 7$.

Though not all children might see this at first, it is clear that by using our rulers this way we have added a 4-unit length to a 3 -unit length to make a 7-unit length. If our rulers are long enough, we can do this with any two numbers.

Children using this cheap adding machine may soon notice some things that rote memorization would never reveal. One would be that when, as in our figure, the left end of one ruler is against the 4 on the other, we can see just by looking at the ruler that:

$$4+1=5$$

$$4+2=6$$

$$4+3=7$$

$4 + 4 = 8$, and so on.

In other words, each time we increase by 1 the number we are adding to 4, our answer increases by 1 . This may seem simple enough to those of us who know it, but it isn't simple to a lot of school-taught children, even those who "know their addition facts." Many of these children might know very well, for example, that $6 + 6 = 12$, but might have to struggle hard to "remember" what $6 + 7$ equaled. Plenty of them would get it wrong - I have seen it myself many times.

The first time a child discovers that when you add 1 to one of two

numbers being added together, you make your answer 1 bigger, it is an exciting discovery, and no less important just because many people know it already.

Later on, the child might discover that when you add 2 to one of two numbers you are adding together, it makes your, answer 2 bigger. More excitement. And the same is true for 3, or 4, and so on.

2.4.2 Using the simple addition machine as a starting point for Algebra

In algebra, we would write our discovery:

$$x + (y + a) = (x + y) + a$$

But I don't think I would tell this to a young child unless he or she were already familiar with the idea that x or y could stand for any number. This, by the way, is probably an idea that most six-year-olds can grasp faster than most ninth-graders at least, ninth-graders who have had eight years of school math.

2.4.3 Other rules that children can learn from this machine

If we use yardsticks or meter sticks, or simply make paper or cardboard rules 40 or 50 units long, or longer, children may notice many more things, such as this sequence and others like it:

$$4 + 3 = 7$$

$$14 + 3 = 17$$

$$24 + 3 = 27$$

$34 + 3 = 37$, and so on.

Again, I have known plenty of school-taught children for whom $4 + 3$, $14 + 3$, $24 + 3$, and $34 + 3$ were completely different problems. They might say that $4 + 3 = 7$ and then turn around and say that $24 + 3 = 29$, or something even more ridiculous. This is what happens when people teach arithmetic as a pile of disconnected facts to be memorized.

Children have no sense of the Logic or order of numbers against which they can check their memory, or that they can use if their memory is uncertain.

2.5 ABSTRACTIONS

2.5.1 *The relation between reality and abstraction*

This section explains that the abstractions are not made out of nowhere. They are related to reality. The people who do abstractions have a certain choice in terms of what they wish to represent as an abstraction and through what means (e.g. lines, or colors, or shapes, or graphs, etc), but that abstraction is linked to reality (e.g. the map of Australia has to look like how Australia is on the globe). One can therefore say that there should always be some 'sense' behind the abstractions.

This overview and what follows can be useful in discussions with kids and answering some of their 'why' questions.

I, and must be taught abstractly People who say this have often heard it said that numbers are abstract, do not understand either numbers or abstractions and abstract-ness. Of course, numbers are abstract, but like any and all other abstractions, they are an abstraction of something. People invented numbers to help them memorize and record certain properties of reality – numbers of animals, boundaries of an annually flooded field, observations of the stars, the moon, the tides, and so on. These numbers did not get their properties from people's imaginations, but from the things they were designed to represent. A map of the United States is an abstraction, but it looks the way it does not because the mapmaker wanted it that wry, but because of the way the United States looks. Of course, mapmakers are and must make certain choices, just as did the inventors of numbers. They can decide that what they want to show on their maps are contours, or climate, or temperature, or rainfall, or roads, or air routes, or the historical growth of the country. Having

decided that, they can decide to color, say, the Louisiana Purchase blue, or red, or yellow— whatever looks nice to them. But once they have decided what they want to map, and how they will represent it, by colors, or Lines, or shading, reality then dictates what the map will look like.

2.5.2 In teaching, move from reality to abstractions and not from abstractions to reality

The same is true with numbers. Down the line, it may be useful to consider numbers and the science of working with them without any reference to what they stand for, just as it might be useful to study the general science of mapping without mapping any one place in particular. But it is illogical confusing and abstract to start there with young children. The only way they can become familiar with the idea of maps, symbol systems, abstractions of reality, is to move from known realities to the maps or symbols of them.

Indeed, we all work this way. I know how contour maps are made— in that sense I understand them; but I cannot do what my brother-in-law, who among other things plans and lays out ski areas, can do. He can look at a contour map and instantly, in his mind's eye, feel the look and shape of the area. The reason he can do this while I can't is that he has walked over dozens of mountains and later looked at and studied and worked on the contour maps of areas where he was walking. No amount of explanation will enable any of us to turn an unfamiliar symbol stem into the reality it stands for. We must go the other way first.'

2.6 MULTIPLICATION

2.6.1 How multiplication can its 'facts' can be taught experientially rather than focussing on memorization and testing it

Just as they are given lists of unrelated "addition facts" and "subtraction facts" to memorize in first and second grades, so most children when they reach third grade, will begin to meet "multiplication facts." One such fact would be that $2 \times 3 = 6$, another that $3 \times 2 = 6$. If children ask about this coincidence, they may well be told, as they were about addition, that

"multiplication is commutative", which of course explains nothing, just tells them in fancier and more mysterious words what they already knew. They will almost certainly be given a list of "100 multiplication facts" to memorize and will be tested on these often. Still later, probably in fifth grade, they will begin to meet fractions and will be told that $1/2 \times 6$ (sometimes "one-half of six") = 3 and that $1/3 \times 6 = 2$. Still, later, they may be told that 2 and 3 are factors of 6.

So, somewhere between first or second and about the seventh grade (depending on which standard arithmetic texts their teachers have been ordered to use) the children will have collected (complete with explanations, and illustrations of baby chicks and pieces of pie) these more or less unrelated facts connected with the number.

$$2 \times 3 = 6$$

$$3 \times 2 = 6$$

$$1/2 \times 6 = 3$$

$$1/3 \times 6 = 2$$

$$6 \times 1/2 = 3$$

$$6 \times 1/3 = 2$$

2 is one-third of 6

3 is one-half of 6

2 and 3 are factors of 6

But, as I said about "addition facts," these are not separate "multiplication facts" or "division facts" or whatever. They are one fact, a fact not of arithmetic but of nature, a natural property of the number 6, which children can find for themselves and verify as often as they need or want to. The fact is that when you have this many objects: ♦♦♦♦♦, you can arrange them like this:



All those "facts" written out above are simply different ways of writing down and talking about this one fact. So anyone, having discovered this property or fact about 6, and having been told the different ways in which we write and talk about this fact, could look for and find similar facts about other numbers, and then use those same ways of writing them down.

2.6.2 Experiential ways of learning about Prime and Composite numbers

People (young or old) who do this will find that there are some numbers (2, 3, 5, 7, et cetera) that they cannot arrange in more than one row and have the rows come out even. They might be interested in knowing that we call such numbers "prime" and all other numbers "composite." One of a number of properties of any and every whole number is that it is either prime or composite.

Some people might be interested in finding out for themselves what some of the prime numbers are, say, up to 200, or in learning that using modern computers, people have been able to list all the primes up to some very large number, or that no one has yet found a formula that he or she can prove will generate all the prime numbers.

2.6.3 John's recommendation for teachers and parents

I am not saying that what I have written above about properties of 6 and our ways of saying and writing them are things that every child should know, or parents must be sure to tell their children. I suspect that what I have said about reading that more children would learn it, and learn it better, if it were illegal, is just as true of elementary arithmetic. And there are many people who are right now leading interesting, useful, satisfying lives who do not know any arithmetic at all. On the other hand, what I have said about numbers here seems to me interesting, and useful in many circumstances. Other things being anywhere equal, I would rather know it than not know it.

In any case, if we are going to show and/or tell children about multiplying, dividing actions, factors, and so on, we would do well to do it more or less as shown above, so that those different ideas of arithmetic are connected from the very beginning.

2.7 THOSE EASY TABLES

In this section, John has explained a couple of very interesting ways of teaching tables that can easily be used in the class. He has criticized the common practice of making kids 'memorize' tables which they find incredibly hard. We can make it interesting, and hence simpler, for children to know how they are made. For this, he first proposes an excellent, yet simple, 10×10 grid filling exercise with various variants. He then explains a classroom activity based on a similar idea. These tips can be really useful for school and homeschools. However, one should not just rely on them but also try to come up with other ways to facilitate learning of other things too so that overall learning becomes a joyful experience.

2.7.1 *Importance of 'knowing' the tables over 'learning' them*

Although many happy and successful adults couldn't recite the multiplication tables to save themselves, it's handy to know them. If we approach them right, they are easy to know, and the patterns they make are exciting for children to discover.

It is important to think in terms of "knowing" the tables, not "learning" them. And the best way to know them is not to sit down and try to memorize them, one at a time, like words in some strange language, but to become familiar with them, to see how they work, and to use them. After a while, we find that we know them without ever having consciously learned them – just as we know many thousands of words in our native language without ever having "learned" any of them. Without being aware of the process, we have become friends with them.

2.7.2 A fun way to 'know' the tables

Here's a way to become familiar with the multiplication tables that will make them easier and more fun to know, that will make them stick better in memory, that will offer something to fall back on when memory is not sure, and that will give some idea of how numbers work, and the beauty and harmony in the patterns they make.

We begin with a 10×10 grid, ten rows of squares, ten squares in each row. Number the rows 1 to 10 down the side, and columns 1 to 10 across the top. Every square in the grid will be in a numbered row and a numbered column. To fill out the grid you put in each square the product of the number of the row it is in, and the number of the column.

	1	2	3	4	5	6	7	8	9	10
1	1									10
2		4	6						18	
3			9					24		
4				16	20		28			
5					25	30			45	
6					30	36				
7				28			49			
8			24			48		64		
9		18							81	
10	10									100

The drawing shows the basic grid with a few of these products filled in.

For the square in the 2 row and the 3 column, the number we want to put inside is the product 2×3 , or 6. In the square in the 4 row and the 5 column, we want the product 4×5 , or 20. And so on. If you yourself don't feel at home with the tables, I'd suggest you fill in an entire grid yourself, taking as much time as you want. Use a calculator if you like.

One way to start children working on tables is to start out with an empty grid and have them slowly fill it in. Give them plenty of time to do this—weeks or even months, if need be. The grid might be posted in some convenient place—the refrigerator door, for example—so that as children figure out a new product they can put it in its proper square. But there's no rush. What will probably happen is what we hope will happen—the children will probably first fill in the 1 and 2 rows and columns, and then the 5 rows and columns, and the 10 rows and columns. They will think of these products as being "easy" Perfect! When they think of a product as being easy they already know it, probably so securely that they will never forget it.

2.7.3 What to do if children make mistakes in filling the grid

Suppose, in filling out these squares, a child makes a mistake. Don't correct it; leave it alone. As children get more familiar with the tables and the patterns they make, they will see that one of the numbers looks wrong, doesn't seem to fit, causes contradictions just as children teaching themselves to read see these kinds of contradictions when they read a word wrong. What is far more important than knowing the tables as such is that children should feel that numbers behave in orderly and sensible ways!

Children, who feel this, when they do make a mistake, can usually say, "Wait a minute; that doesn't make sense," and find and correct the mistake.

2.7.4 When kids complete the grid

At any rate, at some point, the child will put all the products in the grid. If the grid is on the refrigerator door or in some other visible place, filling

in the last square will be quite exciting. There might even be a little ceremony.

2.7.5 Would using a calculator to fill the grid defeat the purpose?

[No!]

Of course, if there is a calculator around, the child who knows how to use it will be able to fill in the grid very quickly. Fine. Even in filling out the grid this way the child will begin to notice some of the patterns. The game may then become, "How much of the grid can I fill out without using the calculator?" Please don't ask, "How much can you remember?" Most of what children know they don't "remember", that is, they aren't conscious of remembering and if we start them worrying about what they can remember and what they can't, we will simply make more and more of their knowledge unavailable to them.

2.7.6 How about playing the game a second time?

Without wanting to turn these suggestions into exact rules, I'd suggest that when the first grid has been filled out, correctly or incorrectly, you take it down from its public place and put up a new blank grid. The child will fill this out more quickly than the first one. More products will seem rasp than happened the first time. If mistakes were made the first time, some or all of them will be noticed and corrected. But even if the same mistake keeps turning up, don't worry. Sooner or later the child will catch and correct it.

2.7.7 Some variations to the game

Here are some variations of the grid-tilling game.

- (1) When children can fill in an entire grid in, say less than five minutes, let them do it against the clock and see how long it takes. Next time, see if they can do it a little faster - children like breaking their own "records."
- (2) See how many products the child can fill in in a given time, say one or two minutes. The child will stay away from the "hard" products, will race

through the products that are already easy, and will spend the most time thinking about those products that used to be hard and that are now beginning to be easy. One day a child will have to think a few seconds to figure that $5 \times 6 = 30$. A few days later the child will know it — that product will have become easy — and will move to other semi-hard products, which will in their turn become easy, until one day all are easy.

(3) Try filling out the grid backward: that is, beginning with the lower right-hand corner, going up each column, and left along each row. Children doing this will see new patterns they hadn't noticed — as you go up the 9's column; the last digit goes up 1 each time, and so on.

(4) Make a grid with the columns and rows numbered randomly, and see how long it takes to fill that out. (This is harder)

Even the amount of drill we have just described is probably unnecessary. The best way for children to come to know the multiplication tables is by discovering the ways in which they relate to each other and the kinds of patterns they make. Thus, children who can multiply by 2 and by 3 have a way to figure out almost all of the tables. Why waste a lot of time memorizing what you know you can quickly figure out? And in any case, children who have figured out half a dozen times what a particular product is will probably remember it next time it comes up.

Yet, many of us, as I mentioned, have found the tables handy to know.

2.7.8 An interesting classroom activity to help children 'know' tables

Years ago, when teaching math I tried various ways to make learning them more interesting and exciting. **When learning is exciting children learn the most.** The following is a memo I wrote at one time: The trouble with almost all kinds of arithmetic drills is that they either bore children or scare them. The result is that either the children learn nothing in the first place or that their learning is so unpleasant that they quickly forget it.

"I have been working with a few third graders who, though bright about

numbers in many ways, have been weak on multiplication tables, which makes my school anxious. It occurred to me one day that I remember telephone numbers more by the way they sound than by the way they look, and therefore, that the old-fashioned way of memorizing by verbal repetition might help the children, if I could jazz it up a bit. The trick would be to engage their full attention without making them anxious.

After a while, I hit on something that seemed to work quite well. I began by putting on the board a grid of all the products of the numbers 6 through 9, like this:

	6	7	8	9
6	36	42	48	54
7	42	49	56	63
8	48	56	64	72
9	54	63	72	81

The children have worked with these grids, and know that the square, which is, for example, in the 6 row and the 7 column should be filled in with the product of 6 and 7. I used 6 through 9 because these are the tables that children think are "hardest" and on which they have the most trouble.

I began with the products filled in, as shown. I had some kind of pointer in each hand. I explained to the children that if I put one of the pointers against, say, the 7 at the left side, and the other against, say, the 9 on top, they were to say "seven nines are sixty-three," and so on. We began. As I moved the pointers around, I could tell by the slowness of their answers that they were having to look for each product. But gradually, as they became more confident, they began to answer more and more quickly without having to look for the product, or perhaps knowing instantly where to find it.

At this point, I had a sudden idea or inspiration and made a change that made the game more interesting. I erased one of the products in the squares. All the children exclaimed at this. I made a point of asking them that product as soon as I had erased it, and quite frequently thereafter so

that it would get a chance to stick, children were surprised and pleased to find that they did remember that product, even when it "was not there." Whether they remembered mostly the sound of their own voices saying the product, or what it had looked like when it was written in, I don't know; I didn't think to ask them. Perhaps it is as well I did not; if they had had to think about how they remembered, I might have jarred the memory loose from their subconscious, and they might have stopped remembering.

As time went on I erased more and more products, just in the 6 row and then in the others. The children became more and more excited and interested as the number of blank squares increased, and as they found to their great astonishment that they really could remember what they could no longer see.

The time came when none of them could remember a product that belonged in one of the blank squares. When this happened, I said nothing; but simply wrote the product back in. This caused further excitement and cries of "I knew it was that!" By the time there were only two or three products left in the grid, the children had turned this exercise into a contest in which they tried to see whether they could get all the squares blanked out before they failed to remember a product. At one point I asked for a product that none of them knew. I took the chalk and started to write it in, but before my hand reached the board one of them shouted the correct answer, and they all began to shout, "you can't write it in, you can't write it in!" I agreed this was only fair. Soon all the squares were blank and they had won the game.

2.7.9 Final comment on the topic of tables

I have no further notes on this subject, so I guess that multiplication tables were soon no longer a problem for us, or at any rate, that I soon stopped seeing them as such. But this might well be a game — it reminds me a little of the card game "Concentration," which children love and are good at — that children could play with adults or each other, those who found the game interesting could of course make it more so by adding more tables,

such as the 11 and 12 and perhaps still others.

2.8 MULTIPLYING LARGE NUMBERS

This section introduces the logic behind the 'algorithm' for multiplication in which large numbers are divided into smaller and easily workable numbers. Having explained the rule, John explains that it is not mandatory to follow this approach if it confuses children. All it is doing is saving writing a few zeros. If it is found to be confusing children, it is not worth it.

Our ways of multiplying multiplace numbers, 24×57 or 132×853 , for example, all depend on a simple fact about numbers. We could say it like this: if two numbers, let's say 3 and 5, add up to another number, in this case, 8, then 2 times 8 is equal to 2 times 3 added to 2 times 5.

We can write this:

$$2 \times 8 = (2 \times 3) + (2 \times 5)$$

But some people are puzzled about why this should be so. Or maybe they can see that it is so for small numbers:

$$3 \times 14 = (3 \times 10) + (3 \times 4) = 30 + 12 = 42$$

But they aren't convinced that it is so for all numbers.

Some math books answer the question "Why are the above statements true!" by saying that multiplication is "distributive over addition." To most people, this won't be very helpful. In any case, it is not an explanation, just the same fact said in other words.

Perhaps if we see clearly enough that what I have been writing about is just a fact of nature, we may not need an explanation. The question "Why is it so?" does not make any more sense than asking why it is that we can split a group of 7 objects into a group of 3 objects and a group of 4 objects. It is so because that's what happens. There isn't some other deeper truth

hiding behind that truth.

Well, to return to our fact about multiplying, one way of seeing that it is true, and is always true, and must be true, is by realizing that when we double a recipe we have to double everything in the recipe. If a recipe calls for two eggs, and we want to double it, we have to use four eggs. If it calls for a cup of flour, and we want to double it, we have to add two cups of flour. Even people who are afraid of numbers and arithmetic will see and feel sure that this is true.

And we can see that it is true that if one group of 7 objects can be made into a group of 3 objects and another group of 4 objects, then two groups of 7 objects can be made into two groups of 3 and two groups of 4: and that three 7's can be made into three 3's and three 4's: This is handy for multiplication because if we didn't know this was so, and wanted to multiply 67 times 8, we would have to write down eight 67's and add them up. But instead of that, we say that $67 = 60 + 7$, so all we have to do is multiply 60×8 (which is 480), and 7×8 (which is 56), and then add 480 + 56, which equals 536. We could write this:

$$67 \times 8 = (60 \times 8) + (7 \times 8) = 480 + 56 = 536$$

From this, it is only an easy step or two to the "rule" or trick or procedure or (as mathematicians call it) the "algorithm" for multiplying multiplace numbers (that is, the multiplication we learned in school). I won't go through it here; it is in any arithmetic text.

However, I wouldn't be in too big a hurry to move children from the longer way of doing multiplication, in which they understand all the steps, to the shorter way approved in school. After all, it isn't that much shorter – all it saves us is writing a few extra zeros. This is not worth the confusion we get when we push children too quickly into it.

Thus, if we had 562×74 , we might just as well write 562×70 and then 562×4 , then figure out those products and add them together to get our final answer. If children get interested in shortcuts, fine, but there is certainly no point in drilling children for weeks or months, as in school, to learn a

slightly shorter way to do a calculation that in real life they will rarely have to do.

2.9 FRACTIONS

2.9.1 *Natural Intuitive sense vs 'taught' sense*

When I first taught fifth grade, before I had "taught" the children anything about fractions, or even mentioned the word, I used to ask them questions like this: "if you had three candy bars, and wanted to divide them evenly among five people, how would you do its" Most of them could think of one or more ways to do this. But after they had "had" fractions, and had learned to think of this as a problem that you had to use fractions to solve, most of them couldn't do it. Instead of reality, and their own common sense and ingenuity, they now had "rules," which they could never keep straight or remember how to apply.

2.9.2 *Can apples and oranges be added?*

In *What Do I Do Monday?* I tried to explain how some of this trouble arises!

When teachers listened to Holt's talks or wrote him letters, invariably they would say something like: *I understand what you're saying, but what can I do about this in my own classroom? What do I do on Monday?* The book *What Do I Do Monday?* is an answer to this question. This book is a rich harvest of possibilities that explains some of the things that can be readily adopted and practiced.

Some readers suggest that this book should be treated as an add-on after reading other books by John; it is not recommended for this to be the first book as it builds on ideas presented in his other books. Much of the recommendations and practices mentioned in this book can get tedious with the detailed descriptions he provides of specific ideas. This however provides an immersive understanding of what of the approaches that give results. Many thoughts presented there can also be applied at home.

Throughout the book are numerous insightful and thought-provoking statements, which one can comfortably expect to see in any of John Holt's books.

As is so often true, our explanations cause more confusion than they clear up. Most of us, when the time comes to "show" and "explain" how to add $\frac{1}{3}$ and $\frac{1}{2}$, say that they have to be changed into sixths "because you can't add apples and oranges." Something like that... The statement is both false in fact and absurd. Of course, we can add apples and oranges. Every week or two I go to the supermarket, put a plastic sack of apples in the cart, then go down the counter and drop in a sack of oranges. I am adding apples and oranges. In the same way, a farmer may put some cows in a barn and then later some horses, thus adding horses to cows. Or a used-car dealer may drive six Fords onto his lot, and follow them with five Chevys, thus adding Chevys to Fords.

The trouble is that we haven't said what we meant, because we haven't thought enough about what we meant. What truth are we groping for?

What is really odd is that many children know or could easily figure out, the answer to this puzzle. I once asked some six-year-olds, "If I put three horses into an empty pasture, and then put two cows in, what would I have in the pasture?" After thinking a while, several of them said, "Five animals."

The first put of the truth we are groping for when we make our confusing statement about apples and oranges is that when we say that we can or cannot add this or that, we are really talking not about the adding itself, but about the way we will express our answer. We can add anything to anything.

2.9.3 The quest for nominators and denominators

The real problem is how shall we talk about the result? The second part of our missing truth is this. It is because we want to find one number - hence numerator - to describe the collection of things we have made by

adding apples and oranges, or horses and cows, or Chevys and Fords, that we have to find one name— hence denominator— to apply to all, the objects in our collection. A name is a class, so we have to think about a class to which all the members of the collection belong. Simple enough. This is what the little children saw easily when they said that if I added three horses and two cows, I would have five animals. If I want to apply a single number— numerator-to all the apples and oranges in my basket, I have to think of a class to which they both belong a name that I can give to all of them, a common name, a common denominator. So I call them fruit. If the used-car dealer, having put several Fords and Chevys on his lot, wants to say what he has there, he can say, "I have five Chevys and six Fords." But if he only wants to use one number to describe his collection; he has to have one name to apply to it, a common denominator. So he says he has eleven automobiles. If he was a dealer in farm machinery and had in his lot not just cars, but tractors, bulldozers, et cetera, he would have to say, "I have so and so many machines."

2.9.4 About the pie in your plate and pie charts

Now the case of fractions is only a very special case of this. If I put half a pie on a plate, and then add to it a third of that same pie (or of another pie of the same size), what can I say about what is on my plate? I can say that I have half of a pie and one-third of a pie. Or I can say that I have two pieces of pie. In this case, "pieces" is a perfectly good common denominator. What it doesn't tell me, of course, is how much pie I have on my plate, whether the pieces are little or big. So I have to do two things. First, find names, denominators, for my pieces of pie that will tell me how much of the whole pie they are. Secondly, arrange things so that both of my pieces have the same name, a common denominator. I can do this by saying that the big piece is three-sixths of the pie, and the small piece is two-sixths of the pie. It is then easy to see that when we add these two together we can call our result five-sixths of a pie.

Having talked about pies I will now say that it is a mistake to use pies and pie diagrams to introduce children to the idea of fractions, for the very simple reason that there is no way for a child to check, either by inspection

or measurement (unless he can measure angles), whether his ideas about adding fractions make any sense or not. Give a child a 6-inch-long strip of paper and a ruler, and ask him to find what half of that piece of paper, plus a third of that same piece, would add up to, and he has a fair chance of coming up with the answer, 5 inches. He can see the reality of what he's doing. This is much less true, or not true at all, of pie diagrams. I remember once carefully making, on cross-ruled (graph) paper, a rectangle nine squares long by three squares wide, and then asking a fifth grader to show me one-third of it. Into the middle of this narrow rectangle, he put his old familiar one-third-pie diagram, then looked at me with great satisfaction. Of course, I tried to tell him that pie diagrams only work for pies, or circles. This obviously seemed to him like one more unnecessarily confusing thing that grown-ups like to tell you. All his other teachers, when they wanted to illustrate fractions, drew pie diagrams; therefore, pie diagrams were fractions. Of course, in time I was able to persuade him that when he was working with me he had to use some other recipe, some other system that I happened to like. But his real ideas about fractions, such as they were did not change.

2.9.5 A practical advice for teachers

The last thing in the world I am suggesting is that we should throw at children all these words about cows and fruit and animals and cars, or that; if we do, they will all know how to add, unlike fractions. I do say that if we, unlike so many arithmetic teachers, know what we are doing when we add unlike fractions and don't talk nonsense about it, we will have a much better chance of finding things to do or say, or materials and projects for the children to work with, that will help them make sense of all this.

2.10 ON INFINITY

This section explains what infinity is. In this, he has also introduced a term called 'transfinite' which I don't remember coming across before. Moreover, the discussion seems to have drifted more towards philosophy than application-oriented

mathematics. It is good to see that towards the end of the section, he has said that there is no need to bog down children with this information if they are not interested.

A mother of a six-year-old once wrote me a wonderful letter about numbers [explaining the child's questions and thinking]. One of his questions was, "What is the number next to infinity?" I thought about this interesting question and explained, in reply, that there is no number before "infinity."

Kids talk about "infinity" as if it were a number, but it isn't. The word infinite means "endless" or "boundless." You can't get to the end, or the edge, because there isn't one; no matter how far up you go, you can keep on going. Not an easy idea, maybe, for a six-year-old, or even most adults, to grasp.

The family or, as mathematicians would say, the "class" of whole numbers (that is, 1, 2, 3, 4, 5 ...), has no biggest number. No matter how big a number we think of, we can always add some other number to it, or multiply it by another number. Mathematicians call this kind of class of numbers not "infinite" but "*transfinite*."

There's a good chapter about transfinite numbers in a fascinating book called *Mathematics and the imagination*, by Kastner and Newman, unfortunately out of print.

Thanks to the technology and digitization of libraries, this book is available for readers again. It has been uploaded by the Public Library of India on the internet archive as a public resource⁵. Many other libraries have also made it available electronically (including its new edition which can be borrowed electronically for a certain

⁵ Link for the file provided by The Public Library of India:
<https://archive.org/details/dli.ernet.509332/page/n7/mode/2up>

duration.

MATHEMATICS AND THE IMAGINATION

Edward Kasner and James R. Newman



"A brilliant and entirely charming book about the subject from which most of us ran away in terror...." — The New Republic

We learn that one transfinite class, such as the class of even numbers, is the same size as another transfinite class, the class of all whole numbers. It seems crazy at first that there can be as many even numbers as there are numbers since half the numbers are odd. Well, we can say that one class of things is the same size as another class of things if for every item in the first class we can match one and just one item in the second class. If for each right shoe we have one and only one left shoe, then we have just as many right shoes as left shoes, even if we don't know exactly how many we have. For every number in the class of whole numbers 1, 2, 3 ..., we can make one and only one even number, by multiplying the first number times 2. One matches with 2, 2 matches with 4, 3 matches with 6, 4 with 8, 5 with 10, and so on, no matter how far we go. So we can say those' two classes are the same size.

There is a wonderful proof, what mathematicians call "elegant" (and it is, too), that the class of fractions is the same size as the class of whole

numbers. That really is hard to believe, since between any two whole numbers you can put as many fractions as you want. But there is a way to do that matching game again, so it must be true. There is another elegant proof that the class of decimals is larger than the class of whole numbers.

In fact, there is an infinite number of decimal points between the two whole numbers.

The mathematician who did a lot of early work on this, Georg Kantor, showed that some transfinite numbers are bigger than others. Indeed, I think he found four or five different transfinite numbers, each bigger than the one before. The class of whole numbers was the smallest, the class of decimals the next smallest. Then a still larger one, which represented (among other things) a class of all functions.

These are big ideas for a six-year-old (or anyone) to grapple with. If the child asks about infinity, one can try them out and see what happens. If the child turns away and starts to look at something else, enough is enough. In any case, talk about "infinite" instead of "infinity." There is no such thing, or mathematical idea, as "infinity." There is just the adjective infinite, meaning, as I said before, without an end or an edge.

On a side note, it might be interesting to observe that many atheists believe in the presence of infinity and that we can't get to the end of it or encompass it in full, yet they are unable to realize that there is a Creator of everything which is beyond the grasp of the human mind – the mind which is so small that it is unable to solve the puzzle of infinity. Strangely, they are ok to believe that "all the even numbers" are equal to "all the numbers" (because both are infinite) and it sounds logical to them (even though it is against the common logic and observation); yet they say that if they can't understand everything about God on the bases of common observation phenomenon, they would not believe in Him. It seems absurd and can be classified as self-delusion.

2.11 BOOTLEG MATH

2.11.1 Game: "I know the number you have thought about"

One can see from the following that this game can be great for learning about additions and subtractions for younger kids. For the kids who are prepared to start their journey into algebra, this can serve as a great interesting starting point. It would be best to include it as an educational activity rather than to leave it as a private leisure affair which many of the students are unable to decipher or decode (and hence it only adds to their amazement and not their learning).

The school I went to for my first four years was very traditional. It taught arithmetic by pure rote memorization, as if we were parrots, or talking laboratory rats. No teacher that I can remember ever discussed mathematical ideas with us, or showed us interesting mathematical tricks. All they did was give us "facts" show us how to do problems, give and correct homework, and drill and test us.

But just as we children had our private secret world of games, so we had our private mathematical world as well. A number of mathematical tricks and games floated around the school, certainly not encouraged by the teachers, and perhaps without their even knowing about them. Often we worked on these mathematical games in class or study hall, hiding our work behind our official math books.

One of these games was "Think of a Number." Student A would come up to student B, preferably with students C, D, and E nearby and there would follow a conversation about like this:

A: Think of a number. Don't tell me what it is, but be sure to remember it.

B: OK I've got it.

A: Make sure you don't forget it!

B: Don't worry, I won't!

A: Now **add three** to it – and don't tell me the answer.

B: Got it.

A: Now **add ten** to it.

B: Got it.

A: Now **take away seven** from it. (No one ever said "Subtract," though the teachers tried to make us)

B: OK

A: Now add five to it.

B: OK

A: Now take away the number you started with.

B: OK

A: (Triumphant) The answer is eleven!

At this point, B, C, and D would challenge A to do the trick again. It might take A several times to convince them that he really knew how to do the trick, and could do it as many times as he wanted. At which point they would walk away, shaking their heads and wondering. Or maybe they would beg him to show them how to do the trick.

No child I knew ever showed another child how to do this trick. Yet every year a gang of us would figure it out and learn to do it, while a new bunch of recruits would come into the school, ready to be tricked and mystified in their turn.

As far as I remember, none of us who did the trick ever wrote down all the operations we asked the others to do. We would do them all in our heads, a step at a time. The longer we could keep going, the more baffled the others would be when we came up with the right answer.

Once in a while, someone, perhaps the trickster, although usually his subject, would make a mistake in adding or subtracting, and the final answers would not agree. A heated and noisy argument would follow, which was usually settled by the trickster demanding a chance to do the trick again. If the answers disagreed two or more times, the trickster would insist that the subject couldn't add properly, and would look for someone else to work on.

Since subjects were usually younger than tricksters, we generally accepted this view of the matter. I would guess that children just beginning to add would find this trick quite exciting.

For those who are curious to know how it actually works, the following equation would explain what just happened during the game:

Suppose X is the number that a child thought in his mind.

The operations happened like this:

$$X + 3$$

$$X + 3 + 10$$

$$X + 3 + 10 - 7$$

$$X + 3 + 10 - 7 + 5$$

$$X + 3 + 10 - 7 + 5 - X$$

The number that was in the mind got removed at the end. We were accordingly left with the following:

$$+ 3 + 10 - 7 + 5 = 11$$

Children can be explained about how it works. They can then come up with their own intuitive games (e.g. different combinations of plus and minus to get 11 as the outcome, or maybe looking for a different number as the outcome – the options

are unlimited. The kids can be as creative as they can be).

2.11.2 Game: Drawing on the grid – and the excellent learning opportunities it can make possible

Another math game that my friends and I used to play in school – a game that the teachers had nothing to do with and may not even have known about – had to be done on paper. Since it took some time, we had to be careful not to get caught doing it.

We would begin with a piece of paper ruled into squares. Since we didn't have graph paper, we had to measure and rule these squares ourselves. Usually, a grid of 10×10 squares was big enough for us, though sometimes, for more elaborate shapes, we would make a bigger one.

Then on our grid, we would make a shape, by drawing straight lines from one grid intersection to another, and so on around until our shape was completed. The shape might be a simplified dog, or sailboat, or airplane, or simply a shape. For the "dog" we would begin (with the dog's nose) somewhere near the left edge of the grid. Then we would say "Go up two squares and two squares over to the right." That would give us our second point. Then we'd say, "Go down two squares and two squares over to the right." That would give our third point. Then, "Four squares over to the right," and so on until the "dog" was finished: Then came the exciting part of the game. Again we would draw a 10×10 grid, but this time with the squares much bigger or smaller than the first one.

On this new grid we would make a shape, following exactly the same steps we had taken to make our first shape, beginning with our starting point, then going up two squares and two over to the right, and so on until the shape was completed. Then we would compare this "new" drawing with our first drawing. We were always absolutely astonished to find that our new shape looked exactly like the first one, only a different size. It seemed like a miracle. We did it over and over again, and every time were just as surprised and delighted to find that our second shape

was just like our first one, only smaller, or bigger.

Since we were "spozed" to be working on regular arithmetic, and we had to keep our pictures hidden, we couldn't get a great variation in size. But if the teachers had known about this game, and had wanted to encourage it, we might have been able to copy a shape from little teeny squares to great big ones, even on a sheet of paper big enough to cooer a large part of a wall. That would have been exciting.

I don't remember that anyone ever thought of numbering the squares along the bottom and up the left side of our grids, or of using these numbers to locate each one of the points on our drawing, like this: 6 7 8 9 10 illustration page 77 and 78

The idea that you could make a shape and then tell someone else how to make a shape just like yours by giving him nothing but a bunch of numbers would have been exciting for us. It would have seemed another miracle.

Drawing

Can YOU COPY the
PICTURE?

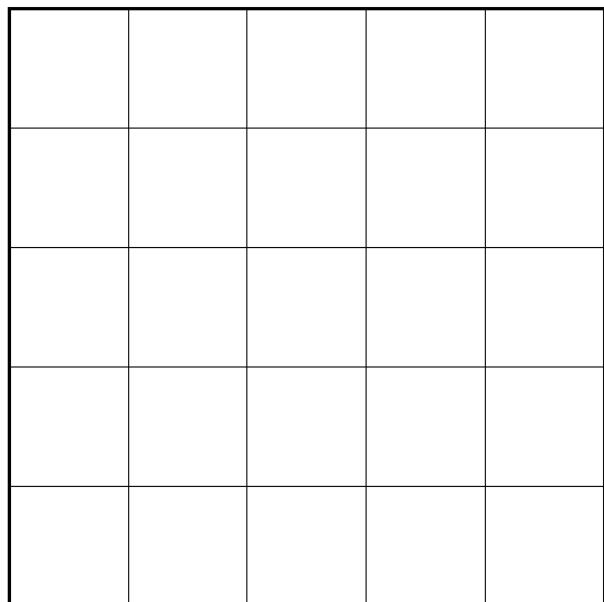
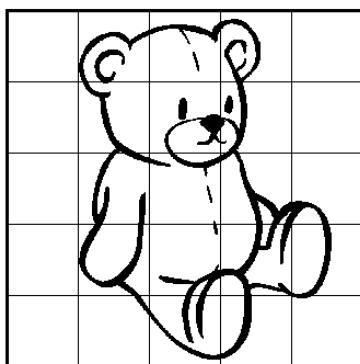


Figure 13: A sample worksheet for grid-drawing

It would also have led easily into the idea of scale drawings, in which a certain distinct on the drawing stands for a certain distance in real life: 1 inch = 1 foot or 1 inch = 100 miles. From there we might have gone into architectural plans - I have always thought that many children, once they understood what a plan was, would be interested in the project of making a plan of their own room, or house. Our game would also have led us into the basic idea of analytic geometry, graphs of equations, and other interesting ideas that students don't usually meet until late in high school – too late, when all but a few of them have learned to hate and fear math.

This game has been able to make its way in some activity books and so on. However, most of the time, a meaningful discussion about the 'why' and 'what else' is missing.

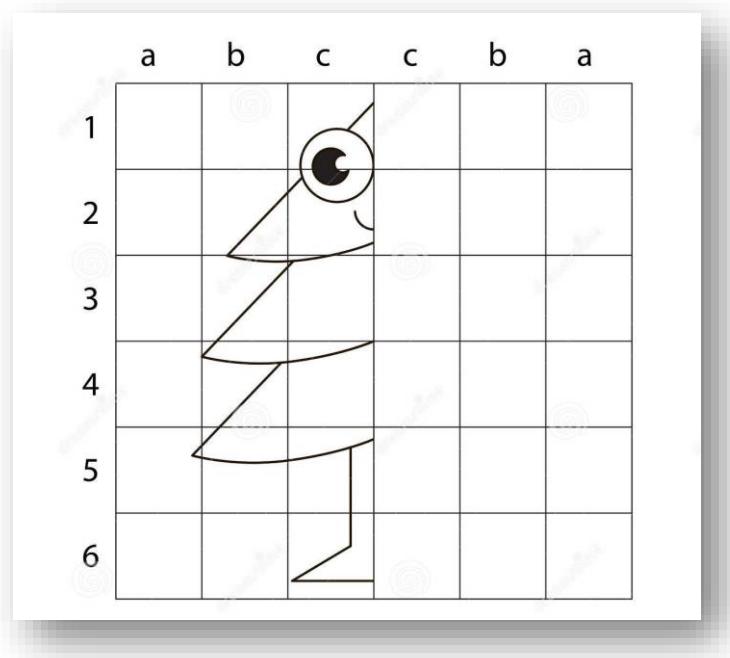


Figure 14: Another variation of grid drawing that can encourage children to think about symmetries. Various innovative learning ideas can be employed using this too

2.12 FAMILY ECONOMICS

2.12.1 Children's urge to deal with real-world matters, including economics

Chris, five, enjoys the ancient adding machine in our office. It is a real old-fashioned electromechanical machine, with wheels and gears that go round inside and make interesting noises, and small metal bars that pop up out of the machine in order to print numbers on the paper – really a much more interesting machine for children than an electronic calculator, which works silently, as if by magic. What he likes to do with the machine is punch in a series of numbers, press the button to add them up, tear off the little strip of paper on which the numbers and the total are written, and call that a "check" showing it to one of us and demanding that we cash it, or telling us that he is going to the bank to cash it. I say to him, "Chris, if the bank does cash that piece of paper, be sure to let me know right away, and I'll be down there in one minute." One day he made these same strips of paper and called them a "bill," which he presented to one of us, demanding that we pay it in return for some piece of work he had done.

Again, and as always with children, we see a nice mix of fantasy and reality. I am fairly sure that in sober moments he knows that these scraps of paper are not in fact checks or bills, but he has seen us at work long enough to sense that they do have something to do with the real checks and bills that come into the office, and that these have a lot to do with money.

2.12.2 The student bank

The first school I taught in had an institution called the Student Bank, run by the school business manager. It was a kind of petty-cash fund for students, and was probably set up because of the fear that if students had much cash around their rooms (it was a boarding school) there might be problems of stealing.

At the beginning of the school year, the parents of each student would make a "deposit" in the student's account in the Student Bank (the amount was, in fact, just added to the parents' bill). When students wanted some

cash, or wanted to buy books or supplies from the school, they would write out a fake "check" and give it to the business manager, who would then give them the cash, supplies, athletic equipment, or whatever. The manager kept a separate account for each student, just like a real bank, and was also supposed to see that students kept their "checkbooks" balanced. The idea was to give the students some practice in keeping track of their own money and in finding out how banks worked.

During one year I also worked as a business manager and had to run the Student Bank. It damn near drove me crazy. Here we were, a few hundred yards from town, where there was a real bank. Why not have the students open up accounts in the real bank, write real checks, and get real statements, instead of wasting a lot of my (or someone's) time running a pretend bank!

Obviously, in some families, the children have so little money that no nearby bank will let them have an account. There is nothing to be done about that. But I feel quite strongly that any children who have enough money so that a local bank will give them an account ought to have one. It is real, grown-up, and interesting – part of the real world out there.

2.12.3 Importance of involving children in family economics

Not many families, however, seem comfortable making children a part of their own financial world. When I was growing up, one of the things my father used to say with real conviction was, "the most important thing in the world is the business of earning a living." Except for that, money was never mentioned in front of me and my sisters. I didn't know then and don't know to this day, how much my father earned, or what other income he may have had, or what taxes we paid, or what rent, or how much my schooling cost, or what our medical bills were, or insurance, or anything. I don't remember that I was particularly curious about these matters, but even if I had been, I would never have dared to ask about them.

I now feel strongly that children should know, or be able to know, the facts about their families' finances – how much money there is, how it is

earned or otherwise received, and how it is spent or saved. Children are interested in these things. Money is one of the most mysterious and attractive parts of the adult world they live in and want to find out about. It is obviously important – the grown-ups talk about it all the time.

2.12.4 Understanding how macro affairs work through understanding the micro affairs

For another thing, the family finances, the economics of the family, are a small and simple version of the economics of the town, state, country, or world. The more you understand the economics of your own family, the more you are likely to understand the economics of larger places.

2.12.5 Polishing mathematics through involvement in family economics

Also, family economics is a way of talking about numbers and arithmetic in a real context, instead of learning to use numbers in the abstract, in a kind of vacuum, so that later (at least in theory) they can begin to use than to think about something real, children can begin to think and talk right now about what is real, and as they do it learn to use numbers. Family economics will bring in such ideas as interest, percentage, loans, mortgages, installments, insurance, and so on, that children learning math only in school would not meet for years. And in talking about money we can use different kinds of graphs, bar-graphs or circle-graphs to show how income and expenses are divided up, or graphs of various quantities against time, to show how various expenses vary through the year (more heat in winter), or from year to year.

2.12.6 Involvement of children in family economics can improve relationships and understanding

Families with little money often find it hard to explain to their children why they don't have or can't have something they want. A father wrote me that he was having a terrible time convincing his child that at the moment he couldn't get him a ten-speed bike. I suggested that he show him exactly how much money the family earned, what it had to spend money on, and what it had to save money for, ad let the child see for

himself that the bicycle money wasn't there. He slid he would. How this worked out, he never told me. At any rate, the child may have learned something worth knowing.

2.12.7 Should this be a compulsory part of home education?

The most important point for me from the following is that it all depends on the child's interest. They should be facilitated to get involved if they wish to and allowed to not take part if they are not interested. It is also okay if they start it out of a sudden spark of interest and then drop it later. This is where most of the very 'determined parents' get stuck. They want their children to continue with what he or she has started irrespective of their interest. This can result in retaliation and the destruction of trust between the parent and child.

As with everything else, some children will be much more interested in money matters than others. If children are not interested, let it go, and just keep the information where they can get it if they want to. But some other children may even want, at least for a while, to keep the family books, records of all the money that comes in and goes out. Here again, I wouldn't turn such a project into a compulsory chore, some quite young children might well start such a project, only to lose interest in it after a while. Let them drop it. Others would be willing and even eager to do the project over a long period of time. In that case, offer them even more responsibility. Let them write checks and pay bills, balance the checkbook, and so on.

2.13 SOLVING PROBLEMS

2.13.1 Why was math invented?

Among the large and important questions about math is the question that millions of tormented schoolchildren must have asked themselves over the years: "What is math for, anyway?" The answer, as I eventually figured

out for myself long after I was out of school, is that people invented math partly for the reason that they invented music – it was fascinating and beautiful – and partly for the practical reason that it helped them solve problems that they wanted or needed to solve and could not solve, or solve as easily, any other way.

One of the earliest of these may have been "How can I be sure that all the sheep I went out with in the morning are with me when I bring them home at night?" Another might have been "How can I tell how big my field is if every spring the floods of the Nile wipe out all of the boundary marks?"

2.13.2 Can math be fun?

It is exciting to figure out how to solve a problem that you really want to solve. Yet, when I talk to meetings of teachers about children and learning, it often happens that someone says, usually in an angry tone of voice, "Learning can't be all fun!" (What they usually mean by this is "Learning can't ever be fun, or it isn't really learning.") They are so wrong about this. Figuring things out, solving problems, is about as much fun as anything we human beings know how to do. For pleasure and excitement, hardly anything beats it, and few things even come close.

2.13.3 The strategy to solve problems

The strategy of solving problems is called "heuristics": in other words, what you do when you are not sure what to do.

2.13.4 Learning to calculate percentages using Heuristics

A heuristic, or heuristic technique, is any approach to problem-solving or self-discovery that employs a practical method that is not guaranteed to be optimal, perfect, or rational, but is nevertheless sufficient for reaching an immediate, short-term goal or approximation. Heuristics, we can say, are the strategies derived from previous experiences with similar problems. Where

finding an optimal solution is impossible or impractical, heuristic methods can be used to speed up the process of finding a satisfactory solution. These strategies depend on using readily accessible, though loosely applicable, information to control problem-solving. Heuristics can also be referred to as mental shortcuts that ease the cognitive load of making a decision. Examples that employ heuristics include using trial and error, a rule of thumb, or an educated guess.

It is interesting to note that heuristics have application in a wide range of disciplines, including psychology, technology, law, maths, and so on.

Take a common problem like figuring out percentages. Many people are never sure which number to divide into which. One-way to figure this out is to start with a very simple problem, one to which you know the answer, and try out various possible methods on that problem. Assuming that you know that 50 percent of something means half of it, make up a very simple problem, of which you know that 50 percent will be the right answer. Thus: "There are six people in a room, and three of them are women. What percentage of the people in the room are women?" You have a 3 and a 6 there, and are not sure which to divide into which. If you divide the 3 into the 6, you get the answer 2, and no matter what you do with the decimal point, you can't make that turn into a 50. So you divide the 6 into the 3 and get .5 for an answer. Well, .5 is not 50, but you can make it 50 by moving the decimal two places to the right. So it looks as if, to find what percentage a small thing is of a big thing, you divide the big thing into the small thing, and then multiply your answer by 100 (or move your decimal point two places to the right, which is the same thing as multiplying by 100). Or, you could say to yourself, "1 is 50 percent of 2," which would suggest that you had to divide the 2 into the 1, rather than the other way around. Or, you might say to yourself, "Since 50 percent is the same as $1/2$, then 50 percent must mean the same as $50/100$ or fifty one-hundredths."

In other words, start with what you know, and use a little guesswork, or common sense, or whatever you want to call it, to figure out what you don't know.

2.13.5 Using slide rule for calculations

When I was in school, scientists and engineers used slide rules to do quick calculations.

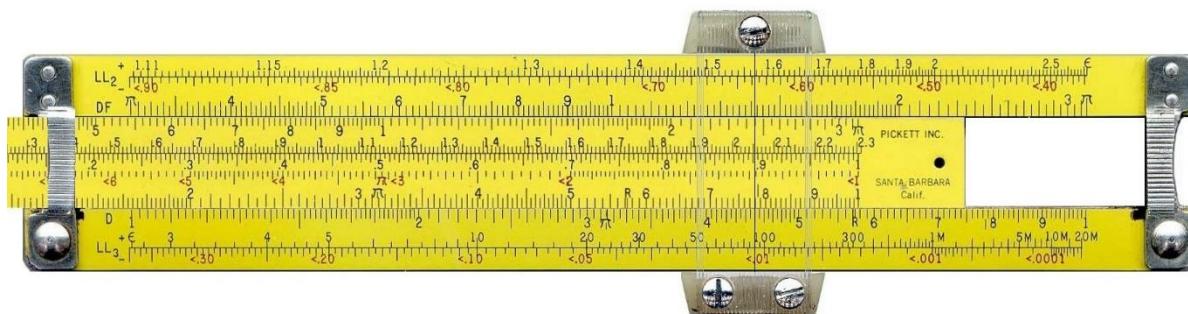


Figure 15: Slide Rule

The slide rule is a graphical analog calculator. It is used primarily for multiplication and division, and also for functions such as exponents, roots, logarithms, and trigonometry, and typically not for addition or subtraction or measurements of length.

Slide rules exist in a diverse range of styles and generally, appear in a linear or circular form with slide rule scales inscribed with standardized graduated markings essential to performing mathematical computations. Slide rules manufactured for specialized fields such as aviation or finance typically feature additional scales that aid in calculations particular to those fields.

At its simplest, each number to be multiplied is represented by a length on a sliding ruler. As the rulers each have a logarithmic scale, it is possible to align them to read the sum of the logarithms, and hence calculate the product of the two numbers. With the increasing availability of power digital alternatives, slides rules are almost out of use. However, it can be explored if their use could benefit young children in their

learning process.

I knew that slide rules existed but had never used one. One day I found myself in a spot where, in a short time, I had to do a lot of problems involving calculation. I knew that the only way I could get them done was by using a slide rule, but obviously, I had to first figure out how. So I made up some very simple problems, like $2 \times 3 = 6$, and then pushed and pulled things around on the slide rule until I got the right answer. Then I checked that with a couple of other simple problems, and when the method worked with them, I knew I could use the slide rule on the harder problems. When you're not sure which of two or three methods to use, then try all of them on a simple problem and see which one gives you the answer that you know is right.

2.13.6 Don't expect all problem solving to be "quick"; make it an aim if you really want it to be solved

In this part of the section, John has explained how he came across a theorem related to factorials. Unable to understand the evidence for that straight away and inspired by a book that challenged him to find a solution, he went on a quest to solve it. This shows that his curiosity was very much intact. He also had a high level of self-belief and self-esteem; this made him accept the challenge. Then came a display of persistence; he kept trying to solve the problem for years. One can see the level of his dedication too that he even used to think about this problem when sleeping. This is the approach we should have too if we are really concerned about something. A wise man said: "Dreams are not what you see during sleep; they are what keep you awake!". In the end, he was able to find a solution that was apparently a simple one. From this, we understand that sometimes our minds get blocked by simple solutions. We should look for all possibilities and all options and not discard some of them unexplored.

Though this section deals with how John, obviously an adult, learned a solution to a problem, the learning and approach can also be reflected upon with regards to how children find solutions and take up problem-solving.

The pleasure of solving a problem does not always come all at one sitting, or from one day to the next as in homework problems.

I once worked on a problem for over twenty years. The problem had to do with a family of numbers called "factorials." Quite a long time ago, mathematicians became interested in this family of numbers:

1

1×2

$1 \times 2 \times 3$

$1 \times 2 \times 3 \times 4$

$1 \times 2 \times 3 \times 4 \times 5$, et cetera

Someone invented a name and a symbol for these numbers, calling 1×2 "2 factorial," and $1 \times 2 \times 3$ "3 factorial," and writing them "2!", "3!", and so on.

When people think about numbers and their properties, the kinds of things we can or can't do with them, one of the elementary properties they look into is what can these numbers be divided by.

One of the things they soon saw about factorials was that:

$4!$ could not be divided by 5

$5!$ could be divided by 6

$6!$ could not be divided by 7

$7!$ could be divided by 8

8! could be divided by 9

9! could be divided by 10

10! could not be divided by 11

11! divisible by 12 Yes

12! divisible by 13 No

13! divisible by 14 Yes

It became obvious that a factorial could not be divided by the next higher number if that next number was what they call "*prime*," which means that it can be divided evenly only by itself and 1. (The prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, et cetera. Some mathematicians, as I said, are still vying to find a formula for all prime numbers.)

With a little more looking they saw this pattern:

4! + 1 is divisible by 5

6! + 1 is divisible by 7

10! + 1 is divisible by 11

12! + 1 is divisible by 13

and so on.

When mathematicians find something like this, that seems to be true for many numbers, they begin to ask themselves whether it is true for all numbers, and whether they can prove that it is. If and when they can, they have what they call a *theorem*. The particular theorem about factorials, which challenged me for so long, was written like this:

Where N is any prime number,

$(N - 1)! + 1$ is divisible by N

By modern standards, this is very primitive math. I don't know when this particular theorem was proved, or by whom – it may go back to the classical Greeks. In any case, finding the proof was an exciting adventure for me.

I ran across this theorem in a book called, I think, *The World of Numbers*.

Originally published in 1946, this book explains different aspects of the world through the lens of mathematics. The author, Herbert McKay, attempts to answer common questions related to time, the size of the earth, and 'numbers that mean too much' and so on, in language that is enthusiastic and easily accessible to non-mathematicians. This book also focussed on the history of mathematics.

At one point the author gave two theorems about factorials, saying that although the proof of these theorems did not involve anything more than simple algebra, probably only people with quite a bit of mathematical talent would be able to work them out. Thus challenged, I began to work on the first theorem (I have long since forgotten the second). I spent hours on it and got nowhere. I decided that I was going to work it out, no matter how long it took.

I never read any further in the book, because I feared that I might see the proof somewhere, and so would never be able to find it for myself. I worked on the problem again a few days later. Again, nothing. And I continued to work on it since. Sometimes I forgot it for as long as a year or more; then something has reminded me of it and I have tried again, always without success.

Once, a few years ago, I thought I had proof – but realized after a while that I had done some circular reasoning and that my proof was no good.

About two days ago something put it in my mind, and I began to work on it again. I tried a new, or almost new, approach. It looked interesting, but after a while, it had not led me anywhere. The work had made me

sleepy, so I lay down for a short nap. I woke thinking of the problem, seeing some of the symbols in my mind. Still half-asleep, I tried a couple of steps. They led to something I couldn't remember having done before.

I considered it for a second, and then sat up, wide-awake, saying, "It can't be that easy." I grabbed some paper and wrote out the steps I had done in my half-awake mind. They were OK. I hadn't made any mistakes. Would my proof work for all cases? Yes, it would. I could hardly believe it – it was so easy, only five steps. I realized that I had been close to it all those years. How could I have missed it? Anyway, now I had it. A fine feeling!

2.14 RIDING, HUNTING, AND ARITHMETIC

Almost all of this section is an account of a father who involved his son in the affairs of adults from an early age. Through this, he developed strong insights into how the business of his father ran. The father introduced the child to arithmetic through various real-life examples and developed his interest in the subject. The time and effort involved in this way of educating are much lesser than the time and effort spent at schools.

Allison Stallibrass, the author of *The Self-Respecting Child*, recently sent me a lovely passage by the British essayist William Cobbett from his book *Rural Rides* (1825).

The *Self-Respecting Child* is a classic study of the spontaneous play of young children playing naturally in a 'gymnasium' in London (in the 1960s). John Holt wrote the foreword of this book. Having a very unique setting and wonderful 'subjects', it combines vivid and delightful observations with profoundly important insights. Alison Stallibrass, an expert on children's play and the mother of five children, makes clear the importance of uninhibited games and activities, without adult interference, in building a child's skill, judgment, and self-esteem, and shows how to make this kind of play possible in a nursery school, day-

care center, or at home.

The intent of the book is not to list all the games that children play, or of all the skills or kinds of knowledge that they acquire through their activities. But it opens up a path to discover the basic needs that children satisfy through play, and to answer such fundamental questions as:

- **Why do children need to play and what sort of play do they choose?**
- **Do children learn through their self-chosen play, and if so – what?**
- **Is this learning necessary for their full and healthy development, and why?**
- **Does the present-day environment of a child allow him to develop the basic human faculties and a healthy, integrated personality, and, if not, what can be done about it?**

Finding answers to these questions and acting upon what is needed is extremely vital to preserve the self-respect of our future generations.

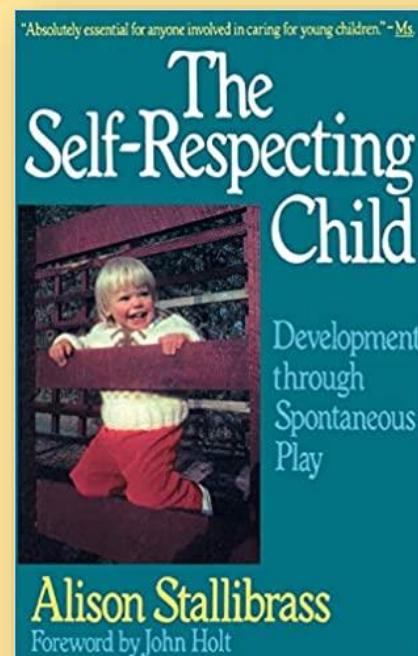


Figure 16: Title of the book The Self-respecting Child

He [Cobbett] was one of the true characters of English literature, first of all, a countryman and farmer, but also a journalist and pamphleteer, a fearless and determined opponent of corruption and a defender of political liberty in the late eighteenth and early nineteenth centuries, when liberty was a risky thing to defend. At one point he was jailed for

his writings, and while he was in jail, his children, none of them older than sixteen or so, ran his large farm very competently, keeping him fully informed about its doing in the letters they sent him along with baskets of food.

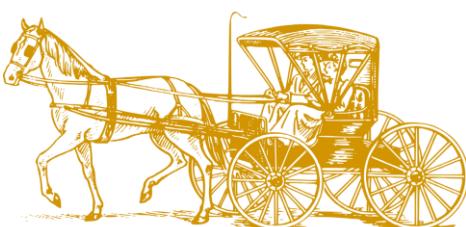
Cobbett was a wonderfully opinionated and outspoken man. Two things above all others could rouse him to passion. One was potatoes, which were then coming very much into fashion and which he felt were a terrible crop. The other was Shakespeare. People who had an overdose of Shakespeare in their schooling will get much pleasure out of what Cobbett had to say about him.

Here is some of what Cobbett wrote about education, and arithmetic in particular, that illustrates much of what I have been trying to say in this chapter and elsewhere:

Richard [his son] and I have done something else besides ride, and hunt, and course, and share about us, during this last month. He was eleven years old last March, and it was now time for him to begin to know something about letters and figures. He has learned to work in the garden, and having been a good deal in the country, knows a great deal about farming affairs... When he and I went from home, I had business in Reigate⁶. It was a very wet morning and we went off long before daylight in a post-chaise⁷, intending to have our horses brought after us.

6 Reigate is a town in Surrey, England, it is 19 miles south of central London.

7 A chaise, sometimes called chay or shay, is a light two or four-wheeled traveling carriage for one or two people with a folding hood or calash top. This name for the said carriage was in use in England from before 1700.



...He had learned from mere play to read, being first set to work of his own accord to find out what was said about Thurtell⁸, when all the world was talking and reading about Thurtell. That had induced us to give him Robinson Crusoe⁹; and that had made him a passable reader. Then he had scrawled down letters and words upon paper, and had written letters to me in the strangest way imaginable. His knowledge of figures he had acquired from the necessity of following the several numbers upon the barrels of seeds brought from America, and the numbers upon the doors of houses.

...I began with 1 pretty long lecture on the utility of arithmetic; the absolute necessity of it, in order for us to make out our accounts of the trees and seeds that we should have to sell in the winter, and the utter impossibility of our getting paid for our pains unless we were able to make out our accounts... Having thus made him understand the utility of the thing, and given him a very strong instance of the case of our nursery affairs, I proceeded to explain to him the meaning of the word arithmetic, the power of figures, according to the place they occupied. I then, for it was still dark, taught him to add a few figures together, I naming the figures one after another, while he, at the mention of each new figure said the amount, and if incorrectly, he was corrected by me. When we had got

8 John Thurtell (21 December 1794 – 9 January 1824) was an English sports promoter, amateur boxer, Royal Marine officer and convicted murderer. Thurtell became a notorious gambler. He owed William Weare, a solicitor, a gambling debt of £300. Rather than paying the debt, he killed Weare. The crime gained a great deal of attention and was the subject of numerous books and stage plays. Besides the gruesome details, the murder was also sensational because it exposed the seedy London underworld of gambling and amateur boxing to a public ignorant of it. As more details were published of the underworld which Thurtell and Weare had inhabited, there were increasing calls for something to be done. The case retained notoriety throughout the century.

9 Robinson Crusoe is a novel by Daniel Defoe, first published on 25 April 1719. The first edition credited the work's protagonist Robinson Crusoe as its author, leading many readers to believe he was a real person and the book a travelogue of true incidents.

a sum of about 24, I said now there is another line of figures on the left of this, and therefore you are to put down the 4 and carry the 2. "What is carrying?" said he. I then explained to him the why and the wherefore of this, and he perfectly understood me at once. We then did several other little sums; and by the time we got to Sutton, it became daylight, I took up a pencil and set him a little sum upon paper which, after making a mistake or two, he did very well.

By the time we got to Reigate he had done several more and at last a pretty long one, with very few errors. We had business all day, and thought no more of our scholarship until we went to bed, and then we did, in our post-chaise fashion, a great many lines in arithmetic before we went to sleep. Thus we went on mixing our riding and hunting with our arithmetic, until we quitted Godalming¹⁰ when he did a sum very nicely in the multiplication of money, filling a little short of what I had laid out, which was to make him learn the four rules in whole numbers first, and then in money before I got home.

... Now when there is so much talk about education, let me ask how many pounds it generally costs parents to have a boy taught this much of arithmetic; how much time it costs also; and, which is a far more serious consideration, how much mortification, and very often how much loss of health, it costs the poor scolded broken-hearted child, who becomes dunder-headed and dull for all this life-time, merely because that has been imposed upon him as a task which he ought to regard as an object of pleasant pursuit. I never ever desired him to stay a moment from any other thing that he had a mind to go at. I just wrote the sums down upon paper laid them upon the table, and left him to tackle them when he pleased.

In the case of the multiplication table, the learning of which is something of a job, and which it is absolutely necessary to learn perfectly, I advised him to go up into his bedroom and read it twenty times over out loud

¹⁰ Godalming is a historic market town, civil parish and administrative centre of the Borough of Waverley in Surrey, England

every morning before he went hunting and ten times over every night after he came back till it all came as a pat upon his lips as the names of persons that he knew He did this, and at the end of about a week he was ready to set upon multiplication. **It is the irksomeness of the thing, which is the greatest bar to learning of every sort.** I took care not to suffer irksomeness to seize his mind for a moment, and the consequence was that which I have described...

Isn't this contradiction to what John has said in this book? The learning being enforced upon the child and focus done on memorization? There could have been better ways of doing as described in this and other books.

... I look upon my boy as being like other boys in general. Their fathers can teach arithmetic as well as I; and if they have not a mind to pursue my method, they must pursue their own. Let them apply to the outside of the head and to the back if they like; let them bargain for thumps and the birch rod; it is their affair and not mine. I never yet saw in my house a child that was afraid, that was in any **fear** whatever; that was ever for a moment under any son of apprehension, on account of the learning of anything; and I never in my life gave a command, an order, a request, or even advice, to look in any book; and I am quite satisfied that the way to make children dunces, to make them detest books, and justify the detestation, is to tease them and bother them upon the subject.

This is a great reminder about the importance of enabling children to not be under pressure or fear if their self-esteem and self-respect are to be kept intact. The mistake that many of us do is that we put children under so much pressure and fear that they break from inside and try to just comply with whatever is told to them to avoid any realistic or unrealistic negative outcomes. This kills their confidence and creativity.

As to age at which children ought to begin to be taught, it is very curious that, while I was at a friend's house during my ride, I looked into, by mere accident, a little child's abridgment of the *History of England*.

...The historian had introduced the circumstance of Alfred's father, who, "through a mistaken notion of kindness to his son, had suffered him to live to the age of twelve years without any attempt being made to give him an education." How did this writer come to know that it was a mistaken notion? Ought he not rather, when he looked at the result, when he considered the astonishing knowledge and great deeds of Alfred, ought he not to have hesitated before he thus criticized the notions of the father! ...I am satisfied that if they had begun to thump the head of Alfred when he was a child, we should not at this day hear talk of Alfred the Great.

CHAPTER THREE

3. YOUNG CHILDREN AS RESEARCH SCIENTISTS



The process by which children turn experience into knowledge is exactly the same, point for point, as the process by which those whom we call scientists make scientific knowledge.

Some of the key messages in this chapter are as follows:

- Children follow a scientific process for their learning. They form theories to answer questions in their mind, experiment to check their theories, and revise them as needed. The adults should not interrupt this process.
- Kids learn by establishing connections between various concepts and abstracts. They are naturally inclined to form connections between various entities (including the ones that apparently look contradictory). They should be facilitated in this connection-building process.
- When adults force certain 'learning upon children', especially that about which they have not yet formed connections, they lose interest in the matter.
- One of the most important points raised in this chapter is about the level of intelligence with which children come to this world. They do not come without any intellect. Their minds, as research suggests, work even more than that of adults. The difference between them and adults is that the adults have been

through more situations in their life than the children. The children should therefore be made to go through various situations themselves and exposed to a lot of things that they can observe, interact with, and as a result, learn from.

3.1 PUZZLES

In this section, John presents a story of a little boy playing with two plastic rings. As he was busy playing with them, his mother silently watched rather than intervening. Many parents, unlike her, are quick to intervene and hence break the learning process of the children. The children, if able to follow their learning process without interruption, follow the same approach as the scientific method. They make hypotheses, do some experiments, make theories, and alter them based on further experimentation. As parents, we should allow this process to continue and let their brains develop and grow. If the interruptions happen for long, the natural scientist in the little ones disappear and their curiosity vanishes. Imagine the creativity and trouble-shooting potential the children would have had their natural learning and problem-solving ability not been destroyed.

3.1.1 Story of a young boy playing with 2 color rings:

One Sunday morning as I was walking up Boylston street, I saw a young mother waiting in a restaurant lobby, watching as her fifteen-month-old baby boy explored the place. She was wonderful with him and gave him lots of room. She didn't try to show him things or help him unless he asked for help. This being one of my favorite forms of entertainment, I stopped and watched him for quite a while. The baby had a couple of colored plastic rings, which he was using as bracelets. He would put them on one of his arms, then later take them off. Quite often he would put them both on his arm at the same time, which he had no trouble with. But sometimes the two would get separated. He would put one bracelet on his arm, up by the elbow. Then he appeared to think to himself, "Now this

other bracelet ought to be right alongside it." But what he would do then would be to put the free bracelet, so to speak, against the part of his arm where the other bracelet was, as if some kind of attraction would hold it there. He had in mind the image of the two bracelets on his arm and wanted to make that happen again. But once he had one bracelet on his arm, he could only think of somehow putting the other bracelet next to it; he couldn't remember how, that first bracelet had got on his arm, or do the same thing with the second bracelet. He could put both on together, but he couldn't put on the first one and then the other. I found myself wondering at what point he would solve his puzzle. As nice as the mother was, I think it's possible that she may not have noticed this little puzzle that her tiny boy was trying unsuccessfully to solve. On the other hand, perhaps she did. But it is from a great many minute and close observations of this kind that we learn something about children and their learning and how we may help (or impede) that learning.

3.1.2 Children follow a scientific process to establish learning:

Children are born passionately eager to make as much sense as they can of things around them. The process by which children turn experience into knowledge is exactly the same, point for point, as the process by which those whom we call scientists make scientific knowledge. **Children observe, they wonder, they speculate, and they ask themselves questions. They think up possible answers, they make theories, they hypothesize, and then they test theories by asking questions or by further observations or experiments or reading. Then they modify the theories as needed, or reject them, and the process continues.** This is what in "grown-up" life is called the— capital S, capital M - Scientific Method. It is precisely what these little guys start doing as soon as they are born.

3.1.3 What happens if we interrupt this process:

If we attempt to control, manipulate, or divert this process, we disturb it. If we continue this long enough, the process stops. **The independent scientist in the child disappears.**

3.2 CREATING KNOWLEDGE

In this section, John mentions a letter that he received from the mother of a four-year-old boy. The mother explained the process through which her child learned about the world around him. He asked many interesting questions. These questions, which come out of natural curiosity in children, enable them to learn about their surroundings and challenge the status quo. Their interesting questions can even become an educational activity for the parents too. Many a time, as we age, we stop being curious and stop asking 'why' about many things. Children, however, are not shy from doing this and accordingly increase their as well as the knowledge of others around them. These questions should be encouraged and answered in the most appropriate manner which would trigger further learning and exploration.

In the second part of this section, John explained how the little boy, J.P. developed a strong interest in lily plants after her mother provided him certain experiences and certain cues. He wanted to do what others would do and not be held back due to his age. Because of the positive response and facilitation from his mother, he was able to acquire a significant amount of knowledge about the plants as well as certain associated admin processes.

In our homes, we should also create environments that enhance curiosity in children, raise questions in their minds for which they become keen to seek answers. They should be involved in various activities at home and facilitated to feel as if they are able to contribute in the same manner as adults.

The mother of J. P., four years old, wrote me a delightful letter describing how her son goes about building his mental model of the world: He wants to know about death, and where babies come from, and whether I still love him when I'm mad at him - and those are the easy questions! Some

of the stuff he comes up with is really startling, like "if there was a hole under our house, why wouldn't it fall all the way to the other side of the world?" and "Why can't we make a car that runs on hydrogen?" (He must have heard somebody talking about that sometime, but the way it came up, we had been looking up what makes balloons rise, and he had asked what makes cars go, a few days before). Sometimes the questions he asks sound strange because he's thinking about things he doesn't have the words for yet, like the other day: "How do cats know to be a cat, when they just eat and aren't there?" I think that means. "How is a specific body form created and maintained without an intelligence-in-residence directing the process?" I had a craven impulse just to say. "God does it," but instead I told him I didn't know — let him read about theology vs. evolution for himself.

J. P. is very interested in gardening and living things. Did you know that if you take a few scale divisions off lily bulbs¹¹ before you plant them, and put them in a plastic bag with a little semi-moist peat moss, they'll make tiny new lily bulbs, right in your kitchen! J. P. was fascinated with mine, so we made him a "nursery pot" of his own, with his very own "lily-babies" in it (once they were big enough to leave their "mommies"). I gave him all the ones that grew a leaf, and to make it more interesting. I cut some pictures out of an old catalog of the flowers they'll have and stapled them on plastic markers, to put next to each bulb. J. P. mixes up "secret formula" fertilizers for them out of mud, bone meal, eggshells, rock phosphate, and whatever else he can scrounge in the greenhouse, and feeds it to them with a turkey baster (I just have to keep him from drowning them). The very first word that J. P. ever spelled on his own was "lily" He wrote it out on an extra seed catalog order form I'd given him. I wasn't paying much attention when he told me he was sending for

11 Lily plant and its bulbs are used extensively in the manufacture of herbal medicines and cures. They are considered especially beneficial for the hearts and lungs. In many cultures, there is a practice of their home-farming for utilization in certain home-based remedies.

some lily-babies, but there it was, clear as anything.

Here we have a wonderful picture of a four-year-old human being doing what all human beings of that age, and other ages, do (though no two of them do it the same way): exploring the world around him, creating knowledge out of his own questions, thoughts, and experiences. All children do this, as we see when we pay a little thoughtful attention to them.

3.3 BUILDING UNDERSTANDING

This section explains a very important concept. It clarifies three causes that hinder understanding. Numerous examples can be given to prove their correctness. Teachers and parents need to understand these things. If we realize that one of these three things are playing a role when the child is not able to understand something, we will focus on this problem rather than getting angry. These three points can also be really important when engaging in conversation with children and helping them with things they need our help with.

As children go about vying [or striving] to explore and understand the world, many of the adults to whom they turn with questions are not as helpful as J. P's mother. It is useful not only for the children in our lives, but for our own learning to think about what understanding, or the lack of it, actually means.

When we don't understand something, one or more of three things are happening:

- First of all, we may have heard a word or words, or seen a sign, for which we don't know the referent (which means the object, thing, or experience that the word or sign refers to). Thus, the referent of the word dog is a four-legged furry animal, usually with a tail. If you had never seen a dog, and someone mentioned the name in conversation, you'd be a little puzzled. Or if you were an Eskimo, and someone

mentioned a giraffe (I can't imagine why), again, you'd be puzzled. If you had lived only in the far North, it would be very hard to "explain" to you what a tree was. Or a mountain, if you lived on flat tundra. People who have never seen snow, even though they have heard of it and even seen photos of it, are usually bowled over when they see the real thing. If you had seen some animals — say, a horse or a cat - I could explain a dog pretty easily, could say that it was smaller than a horse but about the same size as or bigger than a cat, with four legs, a head, and a tail. If you had never seen a four-legged animal at all, it might be a little bit hard to explain how a four-legged animal is put together; you could perhaps draw a picture. But people who have no experience of pictures, primitive vibes, cannot connect in their minds pictures of things with the real things, cannot even recognize a picture of themselves or their own house.

- Another hurdle to understanding is to hear one thing and then another that seems to contradict the first. If you had been told that ducks fly in the air, and that snapping turtles live in the water, and later heard someone say that a duck had been caught by a snapping turtle (which happens), you would be confused. How could that be possible? Someone would then have to say that ducks also live some of the time in the water, at which point you would understand.
- The third problem in understanding is difficulty in making a connection. When someone tells us one thing that seems to make sense, and then some other thing that also seems to make sense, sometimes we can't see how they are connected, what they have to do with each other. If someone tells us something that we think we understand, but it doesn't seem to connect with anything, we think, 'Why are you telling me that?"

Knowing how understanding works can be useful for anyone trying to learn or to explain something to someone else. If you find, reading or hearing someone else talk, that you don't understand something, don't panic. Take a few minutes to ask yourself which of those three cases you are in. If you are reading, and are not sure what the referent of a word or

phrase is, what things is being described, you can ask someone, or look it up in a dictionary or, if the book is a textbook, look it up in the index at the back of the book, see on which page the word first appears, and then see what it says about the word on that page.

If your problem is that two things seem to contradict each other, it will help to say as accurately as you can what the contradiction is, thus: "It says that ducks fly in the air, and that snapping turtles live in the water, so how could a snapping turtle catch a duck?" That is an easy question for someone else to answer.

When a student says to a teacher, "I don't get it," there isn't much the teacher can do about it. If children seem puzzled, ask them to describe the object or situation as they see it, so that the source of confusion will eventually surface. The more precisely we say what it is that confuses us, the easier it will be for someone else to help clear up the confusion.

3.4 MAKING OUR OWN CONNECTIONS

3.4.1 Children themselves have to form their mental connections to relate different things

Jacob Bronowski, in *Science and Human Values*¹², made the point, very

12 Jacob Bronowski (18 January 1908 – 22 August 1974) was a Polish-British mathematician and historian. He is best known for developing a humanistic approach to science, and as the presenter and writer of the thirteen-part 1973 BBC television documentary series, and accompanying book, *The Ascent of Man*, which led to his regard as 'a celebrated intellectual'. During the Second World War, Bronowski worked in operations research for the UK's Ministry of Home Security, where he developed mathematical approaches to bombing strategy.

Science and Human Values was originally a lecture by Jacob Bronowski at MIT in 1953. Published five years later, it opens with Bronowski's description of Nagasaki in 1945 which highlights science's power, both for good and for evil.

Bronowski argues that scientific endeavour is an essentially creative act, part of a great shared human interest in ourselves and the world around us; and, routinely, a process of trial-and-error, the end of which is not – cannot be – preordained.

beautifully and graphically, that discovering the connection between what had seemed two isolated facets of existence is a creative act, whether the field is art or science. He calls it an act of unifying. This is something we cannot do for someone else. We cannot make these connections in someone else's mind. We can give them data. We can even tell them what the connection is. But we must not assume because we have told them, and because they can repeat what we have said, that they really know. They have to discover this for themselves.

3.4.2 Four ways in which we can facilitate the process of establishing connections

That is not to say that children must discover everything unaided. We can help them in several ways. We can so arrange the materials put before them that discovery is made more likely. **Real learning is a process of discovery, and if we want it to happen, we must create the sets of conditions in which discoveries are made. We know what these are. They include i) time, ii) leisure, iii) freedom, and iv) lack of pressure.**

In high school, I studied physics and soon ran into Newton's third law of motion. My reaction to it was to say that it was poppycock¹³. I had been thinking about the problem for years. At the age of about ten or eleven, I had had an argument with some aunts and uncles about rocket ships in space, and I had argued very convincingly that a rocket would not work in space, because there was nothing, no air, for the gas to push against.

3.4.3 How the schools turn our kids into submissive non-questioning beings

How can you push when there is nothing to push against! I was so convincing that to this day I couldn't persuade them that I was on the wrong side of the argument. In high school, I was told that when I pushed

'Above all, Bronowski strove to make science and technology answerable to social progress, to 'human values.'

13 This word is used to refer to something that does not make sense or is empty talk.

against a wall the wall pushed back. What nonsense! One minute the wall is standing there, not pushing; the next minute it is pushing. How does it decide to make the change? And as for the notion that the earth turns slightly under your feet when you walk on it – moonshine! It took a long time to discover for myself that the third law was true. Nobody did it for me; nobody could have done it for me. And, of course, all the time I was grappling with the problem I was handing in physics papers saying things that I did not believe. Eventually, I felt in my bones the truth of what Newton was talking about, so much so that now, when running I really do feel my feet turning the earth under me.

But what often happens to kids in school is that they are required to repeat, as sense, what makes no sense to them, to the point where they give up trying to reconcile what people say about the world with what they really feel about it. They accept as true whatever authority says is true. They do not try to check or test it. They soon forget even how to test it. Oh, sure, it is easy to test the statement that water boils at such and such a temperature; but most of our knowledge, most of what we are asked to accept as true, cannot be so easily tested. I cannot run controlled experiments to test the truth of what people tell me about history, or economics, or human nature. I have to check these statements against my mental model, such as it is.

This, to me, is a fundamental reason for herd mentality and lack of creativity. People do not dare to be different. They do not question things. They accept things as they are. They like to follow the crowd because it is easier. Thinking out of the box is difficult. Even more difficult is to act on out-of-the-box ideas. If we wish to see a change, we have to develop a love and appreciation for questions and enable children to make their own connections.

3.5 LESSONS IN THE FIELD

This section elaborates the approach that John suggested to one of

his friends who was going to assist with the home-schooling of a boy living on an exotic island. John's suggestions revolved around making the learning related to the real world and making the best use of the environment that was available at hand. If children think that they are able to contribute to the world of adults, they become much more interested. The real-world tasks and projects around children have so much to teach them. This way their learning is not broken into separate compartments; it is holistic and provides them an opportunity to apply the learning (unlike school where, in many cases, children are taught things that they are unaware of how and where to apply).

Recently a young friend with an interest in home schooling was invited by a wealthy family on a tropical island to tutor their son for a year or two. At the time, my friend was on the staff of the New Alchemy Institute, an environmental organization devoted to the development of sustainable agriculture and appropriate technology. He wrote me to ask how to plan the boy's "curriculum." I answered him as follows: Since the young person lives in one of the most unusual biological places in the world, it would be foolish not to make that habitat and its special life forms a central part of your study. You should make it an important part of your business to learn as much as you can about this place, and have him learn with you. I think it would be a very good idea to write this boy a letter, quite a long one, telling him something about yourself, your work, your interests, and your particular interests in the islands, and ask him to write you back telling you something about himself and his life and interests... The point is that you have as much to learn about this boy's world as he has to learn about yours. In teaching you, he will learn a great deal about himself. You should tell this boy something of the work of the New Alchemists. Part of your work should be considering what a New Alchemist project on the islands might do. From their location, I would guess that they are very windy, and also, that they have to pay a lot for electricity. Maybe you could do a study of wind power. Given your interest in worms, and by extension, other creatures that feed on wastes,

you might make an inventory of local creatures that could perform such a function.

The thread that is running all through these suggestions of mine is that this boy will learn best and most if his learning grows out of being associated with you in the serious adult world, not school stuff. In all of these projects that I have suggested, there is plenty of mathematics, physics, et cetera. But it will be better if it is rooted in some kind of serious reality. Since I did not know of books on the particular ecology he would encounter, I left that search up to him. Instead, I suggested that he himself record his experiences and that the boy he was "tutoring" could join him in writing about their work together.

3.6 PUTTING MEANING INTO THE WORLD

3.6.1 *Children and their theory-building process*

Children do not move from ignorance about a given thing to knowledge of it in one sudden step, like going to a light that has been off and turning it on, for children do not acquire knowledge, but make it. As I said before, they create knowledge, as scientists do, by observing, wondering, theorizing, and then testing and revising these theories. To go from the point of making a new theory to the point of being sure that it is true often takes them a long time. Usually, children are not aware of these processes, this scientific method that they are continually using. They do not know that they are observing, theorizing, and testing, and revising theories, and would be surprised and baffled if you told them so. At any particular moment in their growth, their minds are full of theories about various aspects of the world around them, including language, which they are constantly testing, but not for the life of them could they tell you what these theories are. We cannot help these unconscious processes by meddling with them. Even when we are trying our best to be helpful, by assisting or improving these processes, we can only do harm.

3.6.2 *Children are not born without intelligence and abilities*

Because Jean Piaget, brilliant and original thinker though he was, did not

understand this about children, both the method he used to try to learn about children's thinking and the conclusions he drew from it were wrong.

Jean William Fritz Piaget (9 August 1896 – 16 September 1980) was a Swiss psychologist known for his work on child development. Jean Piaget is considered to be the pioneer of the constructivist theory of knowing. One of the main postulates of Piaget's theory was that development in children occurs in four stages. In the first stage, termed as Sensorimotor stage, the children are unable to view the world from the perspective of others. According to Piaget, children are unable to understand concrete logic and cannot mentally manipulate information even in their second stage of development which goes till 7 years of age. If analyzed, his theory meant that children are born without any developed mental abilities. This is the conception that we highlighted in the foreword section too. John disagreed with this notion and believed that children are born with intelligence. All they need is to explore the world, form theories, test them, and establish a world-view.

Psychologists are increasingly finding in experiments with children that when they give them a way of showing what they know in actions instead of words, the results of Piaget's experiments are reversed, and the children show that they are indeed capable of doing many things that he said they could not do. Children as young as two have now been shown to be able to do exactly the kind of formal, logical reasoning that he declared was impossible.

3.6.3 A time for de-abstracting will enable kids to do formal reasoning

If we want children to do formal reasoning with different kinds of abstract quantities and shapes, whether these be Cuisenaire rods or Montessori materials or lumps of clay, we must give them time to do what I can only

call "de-abstracting" these objects.



Figure 17: Cuisenaire rods

In other words, using fantasy and play to put some real-life and meaning into them. Thus, to invent an example, if we give a child a small set of wooden colored blocks to play with, and give her time to invent a game in which these become, say, a Mommy, Daddy, and three children, we cannot then fool that child into saying there are more or fewer blocks just by changing their arrangement in space. Shuffle those blocks around however we will, the child will still recognize that here is the Mommy block, here is the Daddy block, and so on, until all me block family is accounted for.

3.6.4 Don't count the sheep or else they won't thrive

I think here of E. E Schumacher's lovely story about the old shepherd. "Don't count the sheep," he said, "or else they won't thrive." By this, he meant that if you counted the sheep you would turn each real, live, unique animal into abstraction or a symbol of a sheep, every one like every other, sheep = sheep = sheep, and so would begin to lose sight of them as individual sheep, and fail to notice whether they were remaining healthy and energetic, their best sheep selves.

What we easily forget, in our passionate twentieth-century love affair

with abstract thinking is that to make an abstraction out of some part of reality we must take some meaning out of it. This makes it so much easier for us to think about whatever it is, manipulate it, measure it, put it into numbers, put it into a computer, that we tend more often than not to think that our abstraction is larger and more real than the reality of which it is only a small part, and to ignore the reality we threw away in order to make our abstraction. We think that whatever we can't count, doesn't count. For instance, schools count the children or countable things they try to get the children to do, and so, like the bad shepherd, they come to think that these numbers are more real than the children themselves. Soon they forget to look at the children, forget even how to look at the children. Children resist this continual abstracting because their chief business in life is finding and making meaning, putting meaning into a world that must at first seem wholly meaningless to them. It is not a weakness on their part but a strength. They are more passionately interested in reality and meaning than we are, and struggle to preserve it, find it, and invent it, wherever and however they can.

3.6.5 How children use formal reasoning and logic

A child of four recently showed me, once again, that little children can and do make use of formal reasoning in their life and growth. Bridger, who often comes to the office with her mother and two sisters, was saying things like "Him moved the boxes" and "Her took the crayons." This surprised me. I have often heard little children say, "Me want this," though not all do — one of my now grown-up niece's first utterances was "I some," meaning "I want some, give me some." But I hadn't heard a child say, "Her do this" or "Him do that." What we have to realize about this is that it is not imitation. Bridget has never heard anyone use "her" or "him" as the subjects of verbs. This is her own application of her own mini-theory of the English language. In this, she is using both inductive and deductive reasoning. From other people's use of the words her and him she arrived at the correct generalization that these were what we (but not she) call pronouns, words that can stand in the place of a noun or a proper name. From there she deduced her particular rule that she could use these

same pronouns as the subjects of verbs. And even as I write about this it occurs to me that she has already stopped doing it — I can't remember her saying that the last few times she has been in the office. So she has already tested her theory about English against her observations of other people's use of it and, seeing that her theory doesn't fit, has changed it. If this is not formal reasoning, nothing is.

CHAPTER

4. LOVING MUSIC



I do not think I have ever heard the voice of God. But I have certainly heard the voice of Satan. Sometimes, when I am listening to beautiful music, that voice whispers in my ear, "But all it does is go up and down." - unpublished proverb of John Holt

Chapter Summary:

At the beginning of the chapter, John explains that it is a myth that one can't learn music in adulthood. He passionately shares his personal experiences to prove that it is very much possible. He debunks another myth that it is necessary for a great performer to have shown signs of great skill from very early on in his or her life. The highest going curves don't necessarily need to start the steepest.

Some of the important points from the rest of the chapter are as follows:

- The most detailed section of this chapter deals with the Suzuki method – a method in which children's curiosity was aroused by engaging parents in the activity that was wished for the children to learn. At the right time, the tools used to be provided to children, and they were allowed to mix and match in what they played rather than waiting to master one tune and then moving to the other. The same method through which children learn to speak was tried to be deployed in this method. A lot of the tunes that the children were expected to play were played at home. Musical notes were not introduced in the early stages just like how children are not exposed to reading and writing before they learn to speak. This method brought some excellent results in Japan. However, the results were*

not so great in America due to the original method being modified and given the form of a 'school'. This resulted in children leaving such schools early and not developing the right expertise except for a few. The key to success is to let the children explore, develop curiosity, and be adventurous. Sense of being a community of like-minded people or the people following the same interest and being able to play the music together would boost learning in students and also foster their interest.

- *Making children listen to music which they have no interest developed in as yet will not make them interested in it. Rather they will try to look for what exists in this situation. If you have to make them listen to something, they have to be interested in it first.*
- *With regards to feeling while playing Music, they cannot be put on a scale ranging from 'no fun' to 'fun'. There are several emotions and feelings involved which cannot be trivialized by the use of the word 'fun' or 'no fun'.*

4.1 ANOTHER CHANCE

Every so often I have a fantasy, a sort of science-fiction fantasy. In this fantasy, some intergalactic federation begins to take note of the fact that the planet Earth, of a particular solar system over at one edge of the Milky Way, is beginning to spew a certain amount of material out into space. The federation decides that it had better go down there and see what these guys are up to. So they send down some representatives to live on earth for a while in disguise and scout around and report back what is going on out there.

After seeing our wars and suffering and nuclear weapons and hydrogen bombs and one thing and another the scouts get their report together pretty quickly. Basically, they say that these Earth folks are a pretty hard lot, and they recommend wiping them out before they make any more trouble than they already are making. But just before the scouts return with their report, somebody persuades them to go to a concert, or a few

concerts, and they hear a chorus, an orchestra, perhaps a cantata, perhaps a string quartet, perhaps..., and after they hear it, they think, "Well, maybe we'll give these folks another chance."

4.2 STARTING EARLY

4.2.1 *Myth: if you don't start early, you can't learn a skill*

If you don't start early, it's too late. This is one of the great mythologies of music, a piece of musical folk-lore. Just as an absolute matter of fact, it is not so. I would love to have somebody do some serious and extensive research in this area. I would love to do it myself, for that matter, but I have and expect I will have too many other kinds of commitments. But even my rather occasional and informal investigations have turned up much evidence that this piece of folklore is only that. Thus, not long ago, I was speaking to a local woman, a professional musician, and the manager of a professional-class civic orchestra. She told me that when she went to the Yale School of Music, presumably at age twenty-one or so, she went only as a pianist. As part of her work there she was required to study a second instrument and took up the viola. Before she left the music school, she was playing at a high enough level to play in the New Haven Symphony, which is a thoroughly professional orchestra. In our conversation, she told me that she knows several people who play professionally, and I mean not just picking up a little money here and there, but at a high level of skill, who did not begin until their twenties. I have absolutely no reason to doubt that this is so.

There is nothing in logic that supports the idea that it is possible as an adult to be skillful enough to play instruments at a certain level, but not to learn to play them at that level. This is and has to be nonsense. Indeed, anybody who plays an instrument at a high level of skill is in fact, and must be, constantly relearning to play it; that is to say, these coordination's must be re-sharpened every day.

My own experience with the cello convinces me absolutely that if I could put the kind of time into the instrument, as I would dearly love to, that a serious young instrumentalist does. I could acquire a very high level of

skill. I started the cello essentially at forty and played a couple of years and stopped for about eight years and began again very nearly from scratch at fifty, which was eight years ago. I'm a long way from being a virtuoso, but the quarter I'm playing in is now working on the Dvorak "American" Quartet, and Schubert's Death and the Maiden. I won't claim we sound like the Juilliard, but we're playing the music and it's not easy.

Nothing I have encountered in my own work in music has convinced me that if I could put in enough time I could not get to be about as good as I want to. I mean good enough to play well most of the great literature. I happen to have about an eighty-hour-a-week job, so I don't get as much time as I'd like.

4.2.2 Myth: the steeper the learning curve at the start, the higher it will go

The myth that if you don't start early you might as well not start, tends to be a self-fulfilling prophecy. The music-making world that young people confront reminds me a lot of the world of school sports. After a lot of weeding out, in the end, you've got a varsity with a few performers and an awful lot of people on the sidelines thinking, "Gee, it's too bad. I wasn't good enough." We need to be careful about that. There seems to be an unspoken idea, in the instruction of the young, that the people who start the fastest will go the farthest. But that's not only an unproven theory; it's not even a tested theory. **The assumption that the steeper the learning curve the higher it will go is also unfounded. If we did things a little differently, we might find out that people whose learning curves were much slower might later on go up just as high or higher.**

4.3 ON PRACTICE

4.3.1 The issue with lingo around 'practicing' music

I think we ought to abolish the word. It only makes trouble. A father once told me that his daughter likes to play the violin, but hates to practice. Why talk about "practice"! Why not just talk about playing the violin? For a professional performer, the distinction between "playing" and

"practicing" is perfectly clear. "Playing" is when you perform before other people, and "practicing" is when you get ready to do it. But this distinction is nonsense for amateurs. What do I do with my cello? I play.

I don't spend part of my time getting ready to play it, and the rest of the time playing it. Some of the time I play scales or things like that; some of the time I play pieces that I am going to play with other people; some of the time I read new music; some of the time I improvise. But all of the time I am playing the cello.

One of the great things that my first teacher did for me was to get me started playing great music, even if it was much too hard for me. And one of my amusements now is playing the first dozen or so bars of Schelomo, which is a virtuoso piece, most of which I couldn't even touch. But there are parts of it I can play, and this is very exciting to me. For me, there is no such thing as "practice." When I play the cello, I play the cello, and that's all there is to it.

4.3.2 Concentration and interest is the key, 'longer practice time' is not

When I think about the tyranny of practice and the myth of starting early, I think of my niece, who began playing the piano at nine. My sister paid for lessons but made no attempt to make the child practice. On the whole, my niece played for perhaps a half-hour a day, perhaps more some days, less others. About all my sister ever did in the way of coercion, if there had been a long spell of no playing at all, was to tell my niece that she didn't need to take lessons if she didn't want to, but that there was no use taking them if she didn't play in between them; it was just discouraging to her teacher. My niece stopped lessons about the time she entered high school, where she was enormously involved with a number of different kinds of activities. She continued to play sporadically, rarely as long as three-quarters of an hour a day, and many days not at all. When she went to college, she could not take her piano with her, and for a couple of years had no access to one. Then later she got some kind of electric piano, which she kept in her room. I think there must have been very few years during her entire growing up when she ever played as much as an hour a day,

and I doubt very much whether the overall average for those years was as much as half an hour a day. However, because when she played it was because she wanted to, and because she is a very musical and music-loving person, and also a very intense kind of character, when she did play it was with the utmost concentration. After she left college, she went to San Francisco, where she has lived for a few years now.

Last year I was visiting my sister when my niece came home for Thanksgiving. I heard her playing the piano in her room, sight-reading Brahms and Debussy, very credibly and musically. She was playing not their hardest pieces, but nothing they wrote is easy. Knowing how little she had been playing, I was truly astonished. More recently, she has been able to get her own piano, a good one, where she lives in San Francisco, and now plays three or more hours a day. One of the pieces she is working on is Bela Bartok's Third Piano Concerto. I have not heard her play it, but from all, I know of her she would not be undertaking it if all she could do was hack through it. Besides, she is living with other musicians, and they would not put up with it.

When I tell people about my niece, they often point out that most children who are not "made" to practice don't reach any such high level. While they may be right, the same is true of children who are made to practice. We need to take serious account of the fact, well known to all musicians, that most children who have been to any great degree pushed into music, however skillful they may become at it, do not enjoy it very much. A number of my professional musician friends have said wistfully that they wished they loved music as much as I do. In Japan, except for a few children who go on into professional training and music-making, virtually all Suzuki violin students, most of whom started out at two or three, drop out of music completely by the age of fourteen. There apparently is little or no amateur music-making in Japan. What price is all that ability?

4.4 SUZUKI

4.4.1 *What made Suzuki develop a new method for teaching music*

I first read about Dr. Shinichi Suzuki's work in Japan in an article in the

New York Times years ago. The article said that one day it occurred to Suzuki that since all Japanese children had the intelligence and skill to accomplish the difficult task of learning to speak Japanese, they could, if they wanted to, learn to play the violin (Suzuki's own instrument) in the same way. Since he believed that children's lives would be much enriched by music, as his own had been. He set out to devise a way of learning violin that would be as close as possible to the method children use to learn their own language. He realized that children had to hear a lot of other people's speech before they could make their own, and that they did a lot of speaking before they did any reading or writing. He also realized that children want very much to do what they see the adults around them doing. From these sound insights, he developed his method.

4.4.2 How the training went on

If Japanese parents wanted their child to study violin by this method, when the child was still a baby they would begin to play at home, every day if possible, and many times each day, recordings played by expert players of some of the simple violin tunes that the child would later learn to play. Soon the child would come to know the tunes and think of them as his or hers. (Later experiments have shown that babies six months old or younger can learn tunes well enough to respond happily when they hear them played.)

When the child was about three, one of the parents, usually the mother, would begin taking violin lessons with a Suzuki teacher, bringing her child with her. At the teacher's house, the teacher would give the mother a violin, show her how to hold it, and then play one of the tunes that the child already knew. Then the teacher would show the mother how to play the tune – since it was the first, it would be simple enough so that she could learn to play it quickly. After the lesson, the teacher would tell the mother to practice that little tune at home until the next lesson. This would go on for a few lessons, the child always going with the mother to the lesson. Then, in perhaps the third or fourth lesson, if the child were still really interested – for Suzuki insisted that he would not force children to play – the teacher would mysteriously produce from somewhere a tiny

child-sized violin, asking the child, "Would you like to try it?" Yes, indeed! So the mother and child would go home together with their violins and would play together the little tune they both knew. After a while, the mother, though she was still expected to listen to the child play and was required to come to the lessons, could if she wished stop playing herself — by this time, the child could go on alone. As time went on, the child would learn other tunes, and along with individual lessons would play in groups with other children, discovering with delight that they too, knew the same tunes.

In the original method, only after children gained considerable fluency on the violin, and could play fairly complicated tunes, were they introduced to the written notes for the tunes that they already could play. Not for still some time, I'm not sure how long would they start learning new tunes from written notes instead of by ear.

So much for the basic method, which seemed to me then, as it does now, in good accord with all I know about children's learning. The Times article went on to say that children were encouraged to experiment with their instruments, to make sounds both fast and slow, high and low — I remember it said that children were asked to make sounds "like an elephant" or "like a little mouse." It then said that all over Japan, hundreds of four, five, and six-year-old children taught by these methods gathered to play music by Vivaldi, Handel, and Bach.

4.4.3 The outcome

A few years later, when a group of these children came to the New England Conservatory on a tour of the U.S., I was there to hear them, along with several hundred others, many of them music teachers. The children, perhaps twenty of them, came on stage, healthy, energetic, and happy. At the time, I thought the average age of the children might be five or six. I now think they may have been a year or two older. Dr. Suzuki and a young assistant checked the tuning of the children's violins. We waited in great suspense. What would they play? Perhaps some of the slower and easier tunes of Vivaldi, Handel, or Bach! Dr. Suzuki gave the

downbeat, and then away they went – playing not some easy tune but the Each Double Concerto, in perfect tune, tempo, and rhythm, and with great energy and musicality. It was breathtaking, hair-raising. I could not have been more astonished if the children had floated up to the ceiling.

Rarely in my life have I seen and heard anything so far beyond the bounds of what I would have thought possible. During the question period. Dr, Suzuki told us (through his young interpreter) that the Japanese children we had heard were unusual in only two respects: their families could afford to pay for this trip to the U.S., and their mothers could go with them. But there were apparently many hundreds or even thousands of children in Japan who could play as well.

4.4.4 How was the Suzuki method borrowed and implemented in other countries

Before saying anything about Suzuki in this country, I have to emphasize that all I know about Suzuki instruction in Japan came from the Times story and a couple of others, and from what I learned at this short meeting. It is possible that the lecture of Suzuki instruction that I made in my mind out of these brief materials was far from accurate. What actually happened then, or happens now, in Suzuki classes in Japan, I don't know. What I can say with certainty is that from all I have seen, heard, and read of it, Suzuki instruction in the U.S. today is very far from the method that I have just described, and even farther from the method by which children learn to speak their own language. Suzuki instruction today is, in fact, very much like most school instruction. The material to be learned is broken down into many very small pieces; each one is supposed to be done perfectly before the next one is attempted; mistakes are corrected instantly, from the outside, by the teacher or parent; there is considerable pressure put on the children to "practice"; and children are given little room or encouragement, if any at all, to improvise and experiment with the instrument.

4.4.5 Reasons for differences in methods and outcomes in other countries

Some of the reasons for this probably have to do with the differences between Japanese and American family life and culture. Japanese women are much more likely to be at home with their children, and Japanese parents, if told by an expert that they must play recordings of simple violin tunes for several hours a day for years on end, are perhaps more likely to do so. To some extent, Dr. Suzuki surely had to modify his method, whatever it was, to take into account differences in American family life, in American adults' ideas about how to treat small children (we are generally much more severe with them than the Japanese), and in American music teachers' ideas about how music had to be taught.

It is also important to note that not all Suzuki teachers are alike – just like all Montessori teachers, or any kind of teachers. Some are more inventive and flexible than others; indeed, as happened with Montessori, some Suzuki teachers have already broken off from the rather rigid American organization and call themselves independent. Suzuki teachers, to give themselves the freedom, if they wish, to modify the strict methods handed down from above. If I ever teach suing playing to adults and/or children, as someday I hope to, I will certainly use Suzuki materials, but much of the time I will use them in my own way. The only way to find out what Suzuki's instruction is like is to see the people doing it. I have seen some astonishingly bad teaching done under the name of Suzuki, and also some very good teaching.

4.5.6 The outcome of deviation from the original Suzuki method

On the whole, though, it is safe to say that Suzuki instruction in this country has become very rigid. And whether because of this or for other reasons, it certainly is not producing the kinds of results that we were told it once produced in Japan. Some very fine string players are coming out of Suzuki training, no question about it. But there are very few six to eight-year-old American children who can play the Each Double Concerto. If you hear large numbers of Suzuki children playing in this country, what you are more likely to hear are simple variations of "Twinkle, Twinkle, Little Star," which (for good enough musical reasons) has become a kind of Suzuki national anthem. The organization and the method are certainly

doing some good, but much less than they apparently once did in Japan and, what is more to the point, much less than they could do here if they really practiced what they preach – that is, help children to learn music in the same way that they once learned their own language.

4.5.7 A fundamental insight from the Suzuki method:

The fundamental insight of Suzuki, the living heart of his method, is that just as children learn to speak by trying-at first very clumsily – to make some of the speech they hear others making around them, so children can best learn to make music by trying to play on their instruments tunes they have heard many times and know.

Some Suzuki teachers may be in danger of losing the point of this fundamental insight. Children learning to speak do not learn to say one short word or phrase perfectly, then another word or phrase, and so on. They say a great many things, as many as they can, and with much use and practice learn to say them better and better. In their learning they advance not on a narrow front but on a very broad one, working on many different things at once. But it looks as if some Suzuki students are being taught to spend a long time learning to play one or two simple tunes "correctly" before moving on to something else. When I hear children doggedly sawing away at "Twinkle, Twinkle, Little Star," all in the first position and using only the lower half of their bows, I don't feel much of the spirit of excitement and adventure that I hear when children are learning to speak.

4.5.8 What then is so good about Suzuki materials and methods?

(1) The musical selections are very good. They are playable – not too hard and not too easy. They are fun to play, and, what is just as important for the parents who will have to hear them over and over again, they are fun (or at the very worst, at least tolerable) to hear. The children are very soon playing pieces written by the great masters. Some have objected that what the children play are simplified versions of what the composers wrote, but I have no objection to that. A child I know well has already moved

from a simplified version of each piece to one much closer to the real thing. It doesn't cause her any problems and I don't see why it should. She just thinks that a piece she already liked has become more interesting.

(2) There are recordings available of good performances of the music that the children will be playing. I suspect that most parents don't play these as much as they might; still, with these recordings, you can do Suzuki as it was supposed to be done; that is, you can make it possible for your children to know these tunes before they start trying to play them, so that, as in learning to talk, they can correct their mistakes rather than have parents or teachers do this for them. One of the things American Suzuki teachers do that may be a mistake is to put little pieces of tape on the violin (or viola or cello) fingerboard so that children (or their parents) can tell by looking at them where the fingers are supposed to go. This is musical nonsense; if is our ears, not our eyes, that are supposed to tell us where' to put our fingers.

This is John's opinion that these pieces of tape would not benefit the children. They would not if their position varies from person to person or depends on one's taste of tone. However, where there is no possibility of a matter of choice and the thing can only be done in one way (i.e. a button to switch something on and off), an identification mark is a good way. This is one of the ways of mistake-proofing and 'visual management' introduced by the Japanese researchers and practitioners of 'Lean' methodology. There are tonnes of case studies proving that this works in many situations. Arrows on the floor regarding which direction to go, signboards to convey certain instructions, color-coding on various things, and so on are some of the many facets of this concept being implemented in practical situations.

(3) The children become members of a musical community. In a performing art, like music, the uniform curriculum for which the schools so mistakenly strive in other areas actually makes sense. Wherever Suzuki children go, they will find that other Suzuki children at about their level

of skill know the same pieces, so they can play them together, which is fun for the children and, beyond that, is one of the chief joys of music. Learning a musical instrument, at least until you get good enough to play in a band or orchestra, used to be a rather lonely business for children. Now it doesn't have to be. Not only can the Suzuki teachers in a community have their pupils play together every week or so, but there are in addition even larger gatherings of children, often hundreds of them, at various Suzuki conferences. These can be enormously exciting to the children. The actual classes and workshops may or may not be interesting but in between them the children can rush around and play with other children all the music they know. One mother of two very talented children, who has gone to several of these big get-togethers, says that the best things that happens there, as far as the children are concerned, are the things that are not planned — informal, spontaneous music-making with other children. For me, this is a very important asset and one that outweighs any objections I have to the program.

4.5.9 Importance or not making “stars” and “others”

On a visit with friends in New York State, I went to two very interesting Suzuki events. First I heard a rehearsal of a young orchestra in which my friends' daughter Vita, age seven, was playing a violin. The young conductor had written a short piece in three parts for them, and it was interesting to watch him help them put it together. Later we went to a formal recital. First, a number of students, ranging from five-year-old beginners to very skillful teenagers, played solo pieces, or, in one case, a piece for three players. Then the small orchestra of which Vita was a member played, in unison, a number of standard Suzuki pieces.

Recitals of children can often be tense and unhappy affairs, but this one was pure pleasure. One thing helped to make it so; I don't know whether this is standard practice at Suzuki recitals everywhere or an invention of this particular group. They did not start the recital with the youngest children and slowly work up to the experts; instead, they mixed beginners and experts more or less randomly. There was no feeling of stars or competition; it was simply a group of children making music together for

their pleasure and the pleasure of their parents and any others who might hear them.

One observation bothered me, however. None of the soloists, not even the very talented girl who played the entire middle movement of the Bruch G Minor Concerto, one of the great pieces of the Romantic repertory, were allowed to tune their own violins; all had to bring them up for one of the adult teachers to tune. I can understand this for the beginners; not only can they probably not hear accurate fifths (the tuning of violins, violas, and cellos are tuned a fifth apart), but their hands are not strong enough to turn the pegs. But why should the advanced players not have tuned their own instruments? I have to assume they knew how.

In the above passage, the term *Bruch G Minor Concerto* has been used. Let us understand that first in order to better understand the meaning of the above passage and why John specifically mentioned this.

A concerto (or concerti from the Italian plural) is understood as an instrumental composition, written for one or more soloists accompanied by an orchestra or other ensemble.



Figure 18: A violin concerto in progress (1960)

Max Bruch (6 January 1838 – 2 October 1920) was a German Romantic composer, teacher, and conductor who wrote more than 200 works, including three violin concertos, the first of which has become a staple of the violin repertoire.

G-minor refers to a particular type of set of tunes.

Perhaps the Suzuki people felt that letting some children tune their instruments while making others bring theirs up for adults to tune might result in drawing just the kind of line between "good" and "bad" players that they did not wish to draw. If this was their idea, then a good case can be made for it. Yet it is most important for even young and inexperienced players to learn as soon as possible to tune their instruments accurately; it is a "basic skill" of string players. If we need to invent devices to make it possible for little children to do this, then let's get busy and invent them.

4.5.10 Key to success

All in all, the Suzuki materials and organization can be a very useful resource— one of many— for children learning music, and for their parents (perhaps also learning music). The trick is to make use of those materials but not restrict oneself to them. Branch out! Encourage the children to improvise freely, to make up tunes, to write down tunes, to write compositions for each other to play, to begin as soon as possible to play real chamber music, which so far does not play a very big part in formal Suzuki instruction— though this may be changing as it should be and as I hope it is:

In short, put back into learning music the exploration, the discovery, the adventure, and above all the joy and excitement that are properly a part of it, and that too formal and rigid instruction can only kill.

4.5 THEY'VE GOT ALL THE EXITS BLOCKED

4.5.1 Would making them listen to music by force make them interested in it?

A friend of mine went to a school concert at which a string quartet was

performing. The audience was fifth or sixth-graders. As sometimes happens, there was one bunch of kids, bored and noisy and making various kinds of fuss. After a while, whoever was in charge told them they had to leave the room. As they left, my friend heard a child just in front of her say, "The luckies." That made me think of a story I read in Symphony News. The author, the conductor of an orchestra that gave a lot of concerts in schools, reported that at one of these concerts, as he was coming near the stage, he came across a couple of boys in a corridor, and he heard one of them say to the other, "It's no use, we can't get out; they've got all the exits blocked." The author went on to say how splendid it was that these children were getting exposed to classical music! I wrote Symphony News that it seemed to me the author had gotten the wrong message from that exchange.

Many of my friends are professional musicians in the field we call classical. Every time they get together it seems to me that they spend a lot of time talking about ways to block more of the exits, to set up more compulsory exposure to music among young people. When I've had enough of this, I usually respond by asking them, "Do you want the schools to do for Beethoven and Mozart what they have already done for Shakespeare?" It rocks them back a little.

Shakespeare is thought to have not gone to school or left early for unknown reasons. What people still wonder about Shakespeare is that how could he write such popular plays and writings without much "school education". From the statement by John Holt, one can understand that he is objecting at the schools that they tried their best to make him a failure, but he chose not to become one. If the schools continue with their practices, they will do the same to Beethoven and Mozart of the future. Both of them were well-known musicians and composers.

4.5.2 Mistakes in persuading children to come to listen to music

When I was traveling more, I used to hear quite a number of concerts and

rehearsals in Indianapolis. The conductor there, Izler Solomon, was a marvelous musician and a great friend of mine. One evening, during an intermission, I fell into conversation with a man there whom I had seen before, a regular concert-goer. After he found out that I was a teacher and knew a lot of kids, he told me how he had been trying to get his children interested in coming to a concert. He said he had never been able to get them to come to hear the symphony. He said they just didn't seem to have any interest in good music. I said to him, "When you talk about symphonic music, these concerts, Is the phrase you use to describe it is "good music?" And he said, "Yes." "Could I possibly persuade you," I said to him, "to call it something else?" He looked at me for a second and then he began to chuckle. "Maybe I see what you mean," he said.

4.6 FEELINGS IN MUSIC

Another word that I want to get out of the vocabulary of music is fun. It is generally used in a negative sense, usually with some asperity, as in "Learning can't all be fun". What this conjures up is that proverbial scale of 1 to 10, or let's say -100 to, + 100, with "fun" on the +100 end of the scale, and "no fun" at the other end (as in "Gee, Ma, this is no fun" or "Gee Ma, why do I have to do this"). The assumption is that while playing music we vary from the "no fun" end of the scale to the "fun" end. If we spend 99 percent of our time at the "no fun" end of the scale, eventually we will get to a point where we have a little fun. I think this is a disastrously mistaken way of looking at music. Nowhere on that scale of "no fun" to "fun" can I find any of the emotions that I feel when I am working with my cello. These range from arduous effort to intense concentration, great frustration, and exasperation to something that can only be called exaltation. There are feelings so deep that one can barely play the music. You can't use the word fun to describe that range of feelings. Nor does the word convey the range of feelings that I observe in a five-year-old friend of mine when she plays her violin or piano.

Sometime in the last year, she decided that she was going to play the violin and made this known to her nice parents, who got her one. She was already quite a remarkable beginning pianist. She is a small child, and to

see these baby starfish hands thumping out a piece is almost beyond imagining. The volume of tone and sound that this mite produces on the piano when she plays with spirit is hard to describe. She and her very talented brother, about four years older, appear to experienced feelings of excitement and passion on the one hand and baffled fury on the other.

Sometimes they just burst out crying, so furious that they can't get the phrase to come out the way they want it to. This five-year-old is not operating on an emotional range with "no fun" at one end and "fun" at the other. We trivialize music when we think in those terms. The effort, the concentration, the frustration, the doggedness, the resolution, the moments of surprise and joy — yes, the exaltation — are in another world altogether.

CHAPTER

5. WHAT PARENTS CAN DO



A veteran teacher summed it up beautifully: "A word to the wise," he said, "is infuriating."

Chapter Summary:

Some of the key points from this lecture are as follows:

- Kids are keen to listen to adults and are very interested in what they say to each other. We should therefore try to be good role models. Children imitate what they see the adults do. This is natural to them. Exposing them to imitable situations can be a wonderful experience for kids. Imam Malik's mother, when sending him to a teacher, said: Learn from his manners first before you learn from his knowledge. This is a fundamental aspect of our deen to be in the company of righteous and follow their behaviours and manners.
- Kids do not like uninvited teaching. Our long answers to their simple questions do not benefit them much. It can even prohibit their learning. The adults should therefore avoid that. What they should do instead is to make real-world things accessible to them. They should provide them with an environment where they can experiment and learn from it.
- Just like uninvited teaching, kids do not appreciate uninvited help too. They often prefer to find solutions by themselves. If

adults provide uninvited help, especially those that children have not developed a trust and relationship with, the children take it as an offense and disrespect. With the trustworthy and known people though, it might make the children interested in understanding the solution proposed and also to experiment with it.

- Another practical suggestion in this chapter is that we should not make our children praise-junkies. Too much praise takes away their confidence and they tend to remain in need of praise to be able to do things.
- Mistakes of children do not need to be corrected in all situations. In fact, some of the situations (if not many) deserve encouragement instead (as explained in the section on 'whose right hand?'. The adults should be thoughtful about this and not try to fix every mistake. The children should be allowed to enjoy their own journey of discovery. Such learning would always stay with him.

5.1 GROWN-UP VOICES

5.1.1 *Children are keen to hear what you say*

When my sister and I were about four and five, perhaps even younger we visited our grandparents. There was a landing on the second floor, with banisters through which we could just see down the stairs into the room where the adults sat talking after dinner. After we had been tucked into bed and good-nights said, and the grown-ups had gone back downstairs, we would slip out of bed, crouch down by the banisters, and listen to the grown-up voices. We couldn't catch more than a few of the words, and in any case, couldn't understand what was being talked about. But the pull of those voices was fascinating. Usually, after a while, we would sneak back into bed. One night, however, we fell asleep there on the landing, where the grown-ups found us when they went up to bed. I don't remember what came of this, whether we were scolded or punished, and

sternly warned not to get out of bed again, or whether the grown-ups said nothing about it.

Since then I have seen in many other families that it is very hard to keep young children in bed if a group of adults is having a lively conversation not too far away. The children will find a hundred different reasons for coming to check out what the grown-ups are doing.

In *What Do I Do Monday*, John Holt writes:

"One of the things that we do for children, just by being among them as ourselves, by our natural talk about our own lives, work, interests, is to widen their World Three, their sense of what is possible and available. But we only do this when we are truly ourselves. If children feel that we are pretending, or playing a role or putting on some kind of mask or acting as some kind of official spokesman for something or other, they learn nothing from us except, perhaps, and sadly enough, that since we cannot be believed and trusted there is nothing to be learned from us."

5.1.2 Everyone is interesting, and all the kids are interested

When I tell this story about my sister and me listening eagerly at the top of the stairs and point out how much children can learn simply from the adult conversation, parents or teachers will sometimes reply, "That's all very fine for privileged families that have interesting visitors. But what about most families, average families?" The answer is, first of all, that all people are interesting. As Studs Terkel and Robert Coles have shown in their (very different) books; everyone has many good stories to tell. As long as real people are talking, children will want to hear their voices and see their faces, and will learn much from them.

5.2 UNINVITED TEACHING

Some of the important discussions in this section are as follows:

- Adults have a variety of experiences and hence higher

knowledge than children. However, oftentimes, children have more curiosity than adults.

- As parents and teachers, we should make things accessible to children
- Give short answers to the question and provide as much detail as they need. The kids do not intend to do a Ph.D. in that topic (at least at that age).
- Uninvited teaching prevents learning. Because of this, the children can get furious
- Urge to teach is natural to us. However, uninvited teaching sends belittling messages to children that something is important but they won't realize this by themselves and if the adults don't teach it to them, they will never get it. Children are really good at picking emotional messages.

5.2.1 How adults are different from children

As far as learning goes, the one advantage we have over children—and in some ways, it's a considerable advantage—is that we have been here longer. We know a lot more. We've had a lot more experience. We know where things are. We have road maps of the world, not just real road maps, but various mental road maps of the world around us.

5.2.2 Make the world accessible to children:

What adults can do for children is to make more and more of that world and the people in it accessible and transparent to them. The key word is *access*: to people, places, experiences, the places where we work, other places we go—cities, countries, streets, buildings. We can also make available tools, books, records, toys, and other resources. On the whole, kids are more interested in the things that adults really use than in the little things we buy especially for them. I mean, anyone who has seen little

kids in the kitchen knows that they would rather play with the pots and pans than anything made by Fisher-Price or Lego or name whomever you will.

5.2.3 Do not make answers to simple questions over-elaborated

We can also help children by answering their questions. However, all adults must be careful here, because we have a tendency, when a child asks us a question, to answer far too much. "Aha," we think, "now I have an opportunity to do some teaching, "and so we deliver a fifteen-minute thesis for an answer. There is a well-known story about a child in school who was assigned to read a book on penguins and write a report on it. His book report had the usual stuff up in the corner: name, grade, school, class, subject, et cetera, and then the title of the book and the author and finally the body of the report, which read as follows: "This book tells me more about the penguins than I want to know."

Whenever a child asks questions, there's a danger to, one might say, penguinize. I heard a similar story about a child who asked her mother some question and the mother was busy or distracted, or perhaps didn't feel she knew enough, and said, "Why don't you ask your father?" The child replied, "Well, I don't want to know that much about it." If children want more, they'll ask for more. The best we can do is simply to answer the specific question and if we don't know the answer say, "I don't know, but maybe we can find it somewhere or so-and-so might know."

5.2.4 Uninvited teaching impedes learning

Not only is it the case that uninvited teaching does not make Learning, but – and this was even harder for me to learn – for the most part, such teaching prevents Learning. Now that's a real shocker. **Ninety-nine percent of the time, teaching that has not been asked for will not result in learning but will impede learning.** With a minimum of observation, parents will find this confirmed all the time. Again and again, in letters and conversations, I hear from parents a story that goes as follows: "My little two-year-old (or three or four) was having some kind of problem

with something the other day and I went over to help her or him and the child turned on me with rage and said, "Leave me alone. Don't do it. Let me do it!" The child got absolutely furious. What happened?" These poor, helpful, well-meaning mothers and fathers reel back from this assault and say, "Why does my child get so furious at me when all I want to do is help?" Well, there is a reason, a very sensible reason.

5.2.5 The hidden messages in the un-invited teaching

Anytime that, without being invited, without being asked, we try to teach somebody else something, anytime we do that, we convey to that person, whether we know it or not, a double message. The first part of the message is: I am teaching you something important, but you're not smart enough to see how important it is. Unless I teach it to you, you'd probably never bother to find out. The second message that uninvited teaching conveys to the other person is: What I'm teaching you is so difficult that, if I didn't teach it to you, you couldn't learn it.

This double message of distrust and contempt is very clearly understood by children, because they are extremely good at receiving emotional messages. It makes them furious. And why shouldn't it! All uninvited teaching contains this message of distrust and contempt. Once I realized this, I found that I had to catch myself all the time. I have to catch the words right on the edge of my tongue. The problem is that we human beings like teaching. We're a teaching animal, as well as a learning animal. We have to restrain that impulse, that habit, that need to explain things to everybody unless we are asked.

Though I agree that uninvited teaching can be harmful to learning, I humbly disagree with the author on the point relating to the above hidden messages. I know that many a time the uninvited teaching can be because of a parent's passion for something or if a parent considers something really important for that child. Children are sensible enough to guess this in most cases. In my personal example, I am very passionate about

poetry (especially the one in the form of nasheeds or naats – i.e. the sung one). We normally play it in our car. As my children don't understand Urdu well, I ask them if they understood what was being said. When they say they didn't, I explain it to them (in a 15-minute thesis or longer). In return, I get mixed responses. My boy really gets excited and starts to feel the same emotions as myself when hearing the same thing again. He often expresses his appreciation for Urdu poets too and praises Allama Iqbal and so on (though he can't read Urdu and all he knows about Iqbal is through the poetry I read to him). On the other hand, my daughter displays a different response as compared to my son. In order to not appear to be disrespectful, she keeps saying 'Ji' (meaning 'Yes, I am understanding what you are saying') but her expressions tell me that she is very bored and not interested. From this, my learning is that the matter of uninvited teaching varies from child to child, depending on the amount of experience they have had, their mood at the time, their interest in a particular thing, how difficult they perceive it to be, and a number of other factors. In some cases, it works, as per my experience, and in some, it doesn't. However, there is no doubt in one thing – if interest is sparked in a kid to learn something, he will himself invite others to facilitate him learn that.

5.3 THE POWER OF EXAMPLE

5.3.1 '*Structure*' or '*freedom*' to learn?

Often when small children become bored and distracted, at home or in nursery school, adults will decide that they "need more structure". I tend to be wary of that term. Since those who use it generally mean only one thing: some adult standing over the child telling him what to do and making sure he does it.

Many young children do indeed need to be introduced to tasks and activities that take time, concentration, effort, and skill. But this isn't a

matter of "giving" harder tasks and making the child persist until he or she is finished. In such situations, the controlling factor is the will of the adult, not, as it should be, the requirements of the task. Instead, what young children need is the opportunity to see older children and adults choosing and undertaking various tasks and working on them over a period of time until they are completed. Children need to get some sense of the processes by which good work is done. The only way they can learn how much time and effort it takes to build, say, a table, is to be able to see someone building a table, from start to finish. Or painting a picture, or repairing a bicycle, or writing a story, or whatever it may be.

5.3.2 Importance of real-life craft and experience at schools

At the Ny Lilleskole, the wonderful small school in Denmark about which I have often written, the six adult "teachers" had all done many kinds of work before they began teaching, and all brought to the school a number of visible and interesting skills. One woman was a good musician and dancer, another a skilled weaver, several of the men were good at working with tools in both wood and metal. One teacher was actually making himself a bass viol at the school. It took a long time: it was a serious instrument. Some of the older kids worked with him on the project; younger kids hung around, helped a little, asked questions; still, younger children watched less attentively, for shorter stretches of time. But even the youngest children were aware of that project going on, and kept track of its progress.

Children need to see things done well. Cooking, and especially baking, where things change their texture and shape (and taste yummy), are skills that children might like to take part in. Typing might be another, and to either or both of these could be added bookmaking and bookbinding. These are crafts that children could take part in from beginning to end. Skilled drawing and painting or woodworking might be others.

Adults must use the skills they have where children can see them. In the unlikely event that they have no skills to speak of, they should learn some, and let the children see them learning, even if only as simple a thing as

touch typing. They should invite children to join them in using these skills. In this way, children can be slowly drawn, at higher and higher levels of energy, commitment, and skill, into more and more serious and worthwhile adult activities.

John provided the following details about 'the little school in Denmark' in his book 'Instead of Education':

“ Here it may be worth taking a further look at the Ny Lilleskole in Denmark, where true teaching can be done because the children there relate to the adults freely, and therefore fearlessly and honestly. A friend of mine, Peggy Hughes, who worked at the school for two years, made a film about it (30 minutes, black and white, sound) called *We Have to Call It School*. Early in the film one of the teachers says, “We have to call it school. Children have to go to school, and if we didn't call this a school they couldn't come here.” But, except that it is a place where children go during school hours, it is in no way like a school. No “education” takes place there. It is in fact a doing place. In it about eighty-five children, aged six or seven to about fourteen, come together with a group of six adults, who work with the children to make a community that is lively, interesting, pleasant, secure, trusting, cooperative, and humane. In this community, the children live their lives as they see fit.

“As they see fit” – these words mean just what they say. Subject only – like all of us – to the limits that they do not hurt each other, or destroy or unduly damage each others’ or common property. The children in this school do what they want, with whom they want, for as long as they want, and all of the time. The teachers, in turn, provide and oversee a place where the children can do this; think up at least some interesting things to do, and provide the means – materials, tools, etc. – to do

them; make use of and share their own many skills and talents; if asked, help the children do the things they want to do; and, in general, are on hand for the children to show things to, or ask questions of, or just to talk to and be with. But they are not there to "exercise their adult responsibility," i.e., to try to hint, or nudge, or bribe, or threaten, or seduce the children into doing what they or someone has decided would be good for them. They do not say to-the children, like the teachers in the so-called "open" British primary schools and their American equivalents, "Get on with it," meaning, get busy and do something that / think is worthwhile.

The school has almost nothing that most people would call an academic program. There are no subjects, no courses, no classes, no preplanned paths down which "the children progress at their own rate," no texts or exams, no marks or grades or report cards, no reports of any kind. There are not even parent conferences, unless occasionally a parent — perhaps anxious, perhaps not — wants to come in and talk. And, as I have said, there is no pressure of any kind to make the children read. No wouldn't-it-be-a-good-idea's or don't-you-think-it's-about-time's. None of that. Nor is there any of what one sees a great deal of at many open or alternative schools — work done by the children, and displayed by the teachers, to impress parents and other adults. Visitors to the school are not shown marvelous samples of the children's writing, or painting, or pottery, or science projects, or whatever it may be. Nor does the school put on plays, dances, pageants, etc., to show the world how creative the children are.

By contrast, I think of an American school, which by my standards might well rank among the top one or two percent in the country. In one of their school bulletins the kindly and intelligent head of the school describes a number of trips the children had taken, to see a boat unload, to visit waterworks,

to interview a man at the railroad station. He then writes: (the trips) gathered facts worth considering, though they seemed to some observers just a lot of riding around. In fact, one father, objecting to the train ride . . . brought up the complaint, "We as a family take plenty of trips in this area, and it seems to me the school ought to have better things to do." He was more understanding, however, when he listened to the children's plan, the list of questions they had made for the interview, and the account of the railroad trip under way. Other trips traced the relationship of land and water in the area. . . . One of the results of this was a six-foot papier-mache map which had an incidental interest almost as great if not greater than the map itself, because to find space for it, we had to hoist it by pulleys to the ceiling. But whose idea was that map? Who really planned that project, made up that list of questions? The outcome of these trips was in maps, oral reports pictures, diagrams, stories, even dances. I never ceased to marvel at the children's ability to represent in a dance what they had seen, and remember with some vividness the dance of, with a child narrator, and music to accompany the cartwheels and whirls representing the different processes. The music teacher in these events brought out in music what they were trying to say.

The "outcome"! Why does there always have to be an outcome?" When I go to see something that interests me, I don't have to do a dance afterward or make a six-foot papier-mache map and hoist it up to the ceiling. I can decide for myself what sort of outcome, if any, I want to have for my experience. More importantly, I can wait until the outcome reveals itself to me. This takes time, sometimes years, and it never happens if "creative teachers" are busily pushing and prodding and motivating to make it happen. I have taught in schools like this, and I know how these outcomes are arrived at, how teachers, with skeptical fathers to placate, "intuitively bring out what the children want to say." The head of the school says he "never

ceased to marvel" at the children's ability to put this or that into a dance. Just as surely the children never ceased to notice him marveling. It doesn't take long at schools like this for children to find out what teachers marvel at and like to see children doing. Or to learn that doing these things brings plenty of approval, smiles, praise, rewards, and good reports and that not doing them, or even seeming not to like doing them, means being pushed out of the charmed circle and into outer darkness. There is none of that at the Ny Lilleskole.

One has to see a place like this to have any idea of what it is like. We are so used to the game that adults and children play, even in "open" schools, the adults worrying about how to make the children do what they want, and whether they are doing enough of it, and the children in their turn worrying about whether to do it or refuse, that we can't imagine what a place might be like in which this game was not played. Having seen the Ny Lilleskole, I can hardly stand to visit most schools, even schools that a few years ago I might have considered good. The contrast between the affected, guarded, held-in, furtive, timid, sneaky, and sullen or seductive children I so often see there, and the unaffected, natural, bold, vital, frank, open, and honest children at the Ny Lilleskole, is too great. I like most children, and like to be around them, but I would rather not see them at all than have to see them in School.

Even a book could not tell more than a small part of what happens, at the Ny Lilleskole, what the children do in it, or how they are changed and strengthened by their lives there. No two children do the same things, and no two days are the same. I hope someone will one day write a book. The point to make here is that the school works.

Even by the narrow academic standards most parents and teachers care about and worry about, the school is highly successful. The children who go there are not selected for IQ or

academic talent. There are no tests to get in. At least some of the children come from other schools where they have done very badly at schoolwork. Yet almost all of the children who have left the Ny Lilleskole have gone to the gymnasium, a very difficult and conventional academic high school, where they have done well. Among those who are old enough, almost all have taken advanced professional training – in a country in which only 5% of young people do so. No school I know of, anywhere, however exclusive or tough, does as well.

No one would claim that these children and their families represent a kind of random cross-section of the Danish population. Most Danes, like most Americans, would not think of sending their children to such a school. The Ny Lilleskole parents, however else they may be alike or different, have one thing in common. They trust their children. If they did not, they would not send them to such a school. In that sense, these parents, and so their children, are exceptional. But this is exactly my point, that we can trust children to find out about the world, and that when trusted, they do find out.



After the above account, John explains what the school exactly looks like in terms of its appearance, resources, and outlook. This description can give hope to many aspiring educators that they can strive to achieve the intended objectives without worrying too much about resources provided their vision of what they want to achieve is clear. While reading the description below, one has to keep in mind that it represents an element of the Danish culture (e.g. drinking beer). The purpose is not at all to copy everything as it is; rather, it is aimed at explaining that great outcomes can be achieved even if the resources are limited.



Bagsvaerd is a small, middle-income suburb of

Copenhagen. The school is in an area, and on a street, zoned for light industrial use. As is often the case in Denmark, the area backs up to a housing development, separated from it only by some small woods, in which the children like to play. The school occupies the first floor of a four-story building (since the town now wants the building for other uses, the school must find other space). The main room of the school, about two-thirds of its space, is long and narrow, with windows on both sides. Since the room was designed for industrial purposes, the windowsills are four or five feet off the floor, so that the children have to climb up to see out of them. But this is no great loss since all there is to see is other buildings much like their own. Off this main space is a very small gym, a room at one end where the school holds all its general meetings, and at the other end, along with lavatories, two small rooms, one used principally for music. One end of the main space is a workshop. The rest is divided into smaller spaces by partitions made of about two thousand wooden beer cases, which the school got free from a brewery when they switched to plastic cases.

These dark green wooden boxes, which are used as dividers, tables, bookshelves, and chairs, all marked ØL (beer) are one of the first things one notices about the school. Soon, they become familiar, natural, and appropriate. Simple, sturdy, cheap, and kindly, they express something of the spirit of the school. I could hardly imagine it without them.

The school is very simply and inexpensively equipped. Most American, British, or Danish school teachers or administrators would consider themselves dreadfully underprivileged if they had to work in a school with no more equipment than this one. In the office is a typewriter (not electric), a tape recorder, and a duplicator. In the main room is a refrigerator and a small stove, on which the children sometimes cook or bake, though in general, they eat the usual Danish lunch of open-faced

sandwiches. There is a very small but good collection of books. In the workshop is a modest set of woodworking tools, tools for heating and working metal, and oxy-acetylene cutting and welding equipment. There is a small collection of games and puzzles. Among the books are some Math and Science books and texts, but I saw very little that I would have called math or science equipment, no math labs, none of the PSSC, Nuffield, etc., science equipment which most American and British elementary schools have come to think of as essential. There was very little art equipment; I do not remember seeing any clay or easels or paints, or children using them. On the other hand, there were signs and other things in the school that the children had painted, so there was either paint around somewhere, or they could get it when they wanted it. There were two or three hand looms, and a sewing machine.

On an earlier visit, I had seen many birds and small animals; when I came back, they were gone, and in their place were many kinds of tropical fish, in tanks which the children had made or helped to make themselves. Some children spent many hours just watching the fish in the tank. There were soccer balls, jump ropes, and some other kinds of sports equipment. In the small gym was one tumbling mat. In the music room was an old, rather beat-up upright piano, some guitars, acoustic and electric, a bass riddle made by a teacher, and a collection of hand drums of different sizes.

This inventory is by no means complete. There was probably some stuff I didn't see or know about. About what I did see, three points should be made. The first is that the school had only a small part of the materials and equipment one would find today either in conventional elementary schools or in open classrooms. The second is that what equipment there was in the school was for the children to use; there was not the usual locked audio-visual closet of the typical American school, or

the elaborate ritual of getting a book out of the library. And the third, and perhaps most important, is that **anyone who wanted to make such a doing place for children would not have to spend much money to equip it.** Children do not need a lot of fancy stuff to work with. The reason children seemed at first to like Math Labs or Science Labs so much is that they were so much better than conventional schoolwork, listening to the teacher, filling in workbooks. But few children with any real range of choices would spend much of their time in a Math Lab or putting together a bunch of chicken bones.

In fairness, I should say that one reason the school does not have more equipment is that it **does not have the money.** There are surely some things the school would like to buy, for teachers and children to use, if it could afford it. Also, these teachers and children are resourceful at finding ways to borrow, or salvage, or buy cheaply many of the materials they do decide they need. Finally, even if the school did have much more money, when the children and the teachers came to decide together, as they now do, how to spend it, they might very well vote for more interesting things than materials. The school now takes a lot of trips, in and around Copenhagen and further than that — one group of students took a walking trip across Sweden. With more money, they would probably take many more.

A word or two about attendance. Children in Denmark, as everywhere else, are required by law to go to school. For all I know, there may be places and schools in Denmark in which this law is as strictly observed and harshly enforced as in the U.S. In this school, it is not. The school does keep attendance records. This does not mean that there is a roll-call, or that everyone has to be at school at a certain time. But on any given day, one of the teachers has the job of making a note of who is and who is not in school. This is not a cause for worry, phone

calls, or other such action. People assume that a child who is not at school has good reasons for not being there and is well occupied wherever he is. Beyond that, the school is such an intimate and open community that if a child is not at school, someone is almost sure to know where he is and what he is doing. Or, if someone misses a day or two of school, he is almost sure, when he comes back, to talk to many people about what he did. It rarely happens that a child will be away from school for more than a day or two without anyone knowing why. If this continues, the teachers will probably begin to check up. Once, when a child was away for quite a number of days at a time, they began thinking about how to get him to come back. But children are free to stay away from school if and when they think they have good reason to do so. They don't have to get permission, and they don't have to account for their absence when they get back. They don't have to prove to anyone that while away from school they occupied their time well. Unlike American college students in work-study programs, when they go back to school they don't have to write a paper about what they did when they were away.

My visits to the school have all been in the spring, in middle or late May. After the long dark winter, when the sun comes out, the Scandinavians like to get out in it. At this time of year, on any given day, perhaps no more than half the children will be in the school. During the winter, they are more likely to be all there. What do they do? I will speak only of a few things I have seen, to give something of the spirit of the school, and the range and variety of things that happen there. Some things the children do all together.

A couple of years ago, after much discussion at school meetings, the school decided that they would have a collective lunch. A certain amount of money would be set aside, some children would buy the food, others would prepare it — slicing

the bread and meat, opening up some cans — and serve it, and all would eat together. This is what happens. It is a very lively, noisy, friendly scene.

Another frequent activity is the school general meeting. Children and teachers take part together, all can speak and vote. All votes count the same. Neill used to say of Summerhill's general meetings that children younger than twelve seldom took a very active part. Here this is not so. The younger children speak up often. The school tries not to decide things based on close votes; people look instead for solutions with which everyone or nearly everyone can agree. They may talk about personal relationships and problems, such as someone bothering or teasing someone else. Or they may talk about school policy itself, including — here they go further, I believe, even than Summerhill — how money should be spent.

One thing they talk about every so often is the physical arrangement of the school, the way the main room is divided by the beer cases into smaller working spaces. This can take many meetings. People say why they don't like the existing layout. Children begin making measurements and drawing up new plans. In time, the meeting decides on a new plan. Then begins a tremendous piece of work, what we used to call in the Navy "an all-hands evolution." All books and equipment have to be taken out of or off the boxes, the partitions have to be taken down, furniture moved. They may give the school a thorough cleaning. Then the beer cases have to be put up according to the new plan, the furniture rearranged, the books and equipment put back. This is a large task, and the children love to take part in it. It is an exciting time. Years ago, I said to some young architects that an ideal school would never be finished, so that the children could keep redesigning and rebuilding it. The Ny Lilleskole is such a school.

One very important part of the daily routine of the school is the

morning exercise-movement-dance session. The school gym is a low-ceilinged room slightly larger than a squash or handball court. The only equipment there is a thick tumbling mat and a couple of Congo drums. Every morning one of the teachers, a skilled musician and dancer, and most of the children meet in the gym. The teacher begins to beat out on a drum a rapid and exciting rhythm, and the children begin to move, jump, and dance. The session is never twice the same. The movements are freely improvised, and one leads to another. The children will often do movements they have done before; some they clearly like better than others. But they and the teacher invent new ones as they go along, vigorous, elegant, skillful. New rhythms beget new movements. Sometimes one of the children beats on the drum, or a child beats one and the teacher the other. It is impossible to convey in words the grace, gaiety, and energy of this scene; I have never seen anything to match it. It goes on a long time. Most of the children are very healthy and energetic, and they burn off a lot of their steam here, though by no means all of it. Though the school has its calm, quiet, reflective days and moods, most of the time the children are very sociable, talkative, active, and noisy; in an American school children far less active are called "hyperactive" and put on drugs. This dance session is the principal organized athletic resource and activity of the school.

For the older boys, many of whom love soccer and dream of being big-time players, there is a park, with a soccer field, perhaps ten minutes' walk from the school, where they often go to play.

Before they got their welding equipment, the school had a Bunsen burner. For about an hour one day three or four children sat around it, I among them. Each of us had a pair of pliers, with which we held a nail in the flame. When a nail grew red hot, soft enough to work, its owner would pull it out and

do something with it. Most of us hammered our nails on a short section of railroad track used as an anvil. I tried to make some nail sculpture, or to see if I could fuse and hammer two hot nails together (I couldn't). One boy, no more than seven or eight, new to the school, did one thing over and over again. He heated his nail red hot, and then stuck it into a piece of wood, which charred and smoked. If anyone else bumped his nail or took too much of the flame, he let out a bellow which, if it didn't scare the other children, certainly terrified me. I have never sensed more violence and anger in a child. I hardly dared think what he might be imagining when he stuck his nail into the wood. That was our only contact. Two years later, when I next visited the school, he was a peaceful, kindly, happy child — and incidentally, one of the school's most skilled metalworkers and welders. To my surprise and pleasure, he remembered me, and as a friend.

The music room. One of the teachers, a musician, a competent jazz pianist, was showing a boy how to play certain jazz chord progressions on the electric guitar. He talked, demonstrated, they played together. Two other younger boys joined- them on the Congo drums. They were not good enough even to keep strict time, let alone be any sort of inspiration. But no one suggested that they should not play. There were no irritated glances, no feeling in the air of "Can't you see we're busy." Two or three other children were in the room, like myself, just watching. Now and then, when the piano and the guitar got into their stride, I whistled a bit of blues solo, as I like to do. Another child sat up on the window and looked outside. People were participating at many levels of skill and attention, and all were allowed. As Mrs. Stallibrass aptly writes, "Watching is an important activity; the child's need to watch should be respected and he should not be distracted from his absorption in watching the others, or 'stimulated'. . . . Some children . . . like to see others do things before they try to do

them themselves; they like to ponder and consider what they will do before they do it." At the Ny Lilleskole, everyone understands this.

The meeting room has no furniture. At meetings, people sit at one end on built-in carpeted bleachers. Otherwise, the room is usually empty. For several days running a girl, about fourteen, spent an hour or so throwing a tennis ball against the wall and catching it, seeing how many times in a row she could do this without missing, usually between twenty and forty. Another time, a group of six girls, the youngest perhaps eight, the oldest twelve or so, were jumping rope. They did this for an hour or two a day, many days running. They played with different rules and combinations, and with great seriousness and concentration.

A young boy, new to the school, full of violence and anger, one of a small group that the children themselves (some of whom had once been the same) call "The Terrorists." Flailing about with some sort of cardboard box, he hit a ten-year-old girl in the eye, hard enough so that it really hurt, and ran off, hardly noting what he had done. She put her hands over her eye and bent over in pain. Other children and at least one of the teachers saw this. The people near her asked if she was all right, and gave her sympathy and comfort. Otherwise, nothing happened! In almost any other school I have ever seen the girl would have set up an outcry, other children would have told the teacher and demanded he do something about it, and the small child would probably have been dragged back to apologize, and perhaps, to be punished. Here the adults, the children, even the girl who was hurt; all felt that this wild small child had not hurt the girl on purpose. Perhaps he was already frightened, and ashamed. So why punish him, or shame him further: Why make him feel, any more strongly than he did already, that he was no good, when it was just this feeling that

made him act so wildly? Why not instead help him feel that in this place he need not always worry about being judged and punished?

And it is in just this way, and not with lectures and punishments, that the school文明izes its terrorists. The adults are patient, trusting, and forgiving with the children, and in time the children become the same way with each other. Not that they don't push, shove, quarrel, shout, and yell if someone takes their sandwich or something they are working on. They get sore at each other, but unlike kids in most schools they are not always tattle-telling, not always trying to line up the teacher on their side, and they don't hold grudges or stay angry for long.



John then moves on and explains 'Why It Works':

“ All of this may begin to explain to a small degree why the children are lively and happy there. It does not explain how the children get so good at conventional schoolwork. What happens to account for that? The answer is given by the teacher narrating the film.

After showing and talking about some of what the children do, he says, "Mostly we talk and listen to each other." That is mostly what they do. This does not mean that the teachers talk and the children listen. There are no lectures, disguised or otherwise. Nor do the teachers, as in many up-to-date schools, "hold discussions." There are only conversations, between children, or children and adults together. How do the latter start? Usually, because a child is doing something with an adult, and they begin to talk as they do it. In time others join in. The conversation moves this way and that, as true conversations do. People leave, others join in. The talking

group splits into two talking groups, or three. The conversation never ends. It may stop for a while, but the thought goes on, and the conversation will start again another day. In the thought as well as the action of the children there is the continuum of experience that Dennison wrote about in *The Lives of Children*, and that children never have in most schools, where the thought is continually interrupted and broken up with bells, classes, lesson plans, guided discussions, and so on. Sometimes children listen to adults talking, or young children to the older. Even the teachers' meetings are not shut off from the children; they are not encouraged to butt in, but they are not told to go away.

Please do not take this description as a method, a formula for running a school, something that can be taught in a school of education. This school is a human community, and a large part of what makes it work are the adults in it. They are a most unusual group of teachers, in at least three respects. In the first place, they are competent in many ways, not just at teaching. Most of them come to teaching after having done many other kinds of work and having had other kinds of experience, and they bring their competent and experience to the school. They can do things, make things, fix things. This is important to children; they like to do things, and are enormously interested in and attracted to adults who can do things. Much of the great natural authority of these teachers comes from their competence. And many of the problems of American open or free or alternative schools arise from the fact that their teachers often have too little competence. Young people often tell me, sincerely, convincingly, how much they like and respect children, and want to work with them in a free school. They are surprised when I ask, "What can you do?" Too often, they can't do anything; all they have done for years is be a student. But isn't love and goodwill enough? No, it isn't enough. Most kids, most of the time, will swap a pound of love for an ounce of

competence. Beyond this, the Ny Lilleskole teachers are intelligent, informed, interested, and interesting. They know a lot about the world, and they think about it. By contrast, large surveys of American teachers, quoted by Myron Brenton in *What's Happened to Teacher*, have shown that most of them are not very informed or curious. They read very little. Their favorite magazine is Reader's Digest. Many of them read-only about one book per year; of those who read more, most read light escape fiction. Like average people in most modern countries, they don't know much and they can't do much — and what they know or can do, they don't talk about or do in school. In short, they are not people that curious, active, and healthy children would choose to spend much time with.

It is also important that the Ny Lilleskole teachers are not alienated. They do not hate, or fear, or despise their country, Denmark. There is much about it that they don't like and hope to change. But they are fond of it, and at home in it. It is where they like to be; they spend their vacations there. Nor do they hate the world. For all its faults, it is still a beautiful, varied, fascinating place, full of exciting, interesting, useful things to do. They do not hate their own lives. They like being grown up, and are full of zest and energy. They do not tell their pupils that childhood is the best time of life, or try to lock them up in it for as long as they can.

They know that children want to grow up, get bigger and stronger, see more of the world and do more things in it, and they are ready and glad to help them do it. This is not always true of American alternative schools. Too often, they have attracted as teachers young people who are deeply alienated from life, their country, and the world around them. "Life is a bummer" might be their motto. I sympathize with them and understand why they feel this way. But such people are not much help or use to kids. Kids have no quarrel with the world.

It is there, and they want to get out in it. They do not want to hear how awful it is, or that there is 'nothing worth doing in it, or that the only good or sensible thing to do is work to destroy it or escape from it as far as possible.

Perhaps most important of all, the teachers at Ny Lilleskole are open and truthful. That is, they will talk about anything the children want to talk about, say what they truly think, and admit what they don't know. This is not true of most teachers. A survey quoted by Brenton showed that about 90% of American teachers believe that they should not, and in fact do not discuss or permit children to discuss what they call controversial subjects in school, though they understand very well that these are precisely the subjects that interest children the most. Thus in conventional schools children can rarely talk, and when they do, cannot talk honestly or about what they most want to talk about. Beyond this, most teachers are told, over and over again, both in their training and in their work, never to admit ignorance, uncertainty, or confusion. Above all, "keep a professional distance," i.e., never talk candidly about your private life and feelings. But these are what interest children most of all, since only from these can they begin to sense what it's like to be a grown-up.

So the children from the Ny Lilleskole do very well later in the conventional schools for many reasons. They are still curious about the world, confident that they can find out about it, and good at doing it. Having for many hours of the day, for many years, actively, seriously, and intently talked and listened to many people, they have become very good at using language — a large part of what ordinary school is about. Having coped with a wide variety of social situations, in and out of school, they can handle very easily the rather limited challenges of conventional school. After all, any kid who keeps his eyes and ears open can figure out in a short time how to give his

conventional school teachers what they want. It's an easy trick — once you understand that it is only a trick. But above all, these children do better than their conventionally schooled friends because they know so much more.

People ask how, after years of being able to do what they want, the children can stand going to a very conventional school. Don't they dislike it? Of course, they dislike it. They think it's absurd. But they are smart, they have learned to cope. Also, they are realists. They have learned enough about themselves and the world to know that the road to doing many of the things they might want to do leads through the gymnasium and the university, and so they are ready to take that road, bumps and all. Also, like a few children I know in the U.S., they are probably much more able than most of their

schoolmates (who can only submit to school or resist it) to make use of the school, to get from it at least some of the things they want for their own reasons.

As much as we may like the sound of the Ny Lilleskole, we must not forget that it is still a School. More important, it is one whose example very few Schools, even in Denmark, let alone other countries, could follow. In the first place, it is a private school, not part of the Danish state school system, which, as far as I know, has not even one school like it or any plans to make one. Yet it gets most of its money from the government, under a Danish law which says that if a certain number of parents can start a school and run it on their own for a year, the government will, from then on, pay 85% of their operating expenses. The other 15% they must raise themselves, which is hard to do in a country in which, if none are very poor, few are very rich, and where there is no tradition of paying for children's schooling. Under this law, about forty small independent schools, called "little schools" have been formed. No other country I know of

has or is likely to pass such a law.

Without such government support, the Ny Lilleskole could probably not exist and certainly not in its present form. It would have to depend on the support, and therefore the approval, of people much richer than most of its present parents. But neither in Denmark nor anywhere else are the very rich likely to support a school that believes that cooperating and helping others is more important than being first.

The school is able to operate as informally as it does and to allow children (with their families) to decide when they will come to school and for how long they will stay, because the government school inspectors in its district support or at least tolerate what it is doing. In another part of the country, with different inspectors, the school might not be so fortunate, might in many respects have to stick much closer to the letter of the law.

Finally, the school can do what it does because, even if it doesn't try to be or want to be, it is a school for winners, i.e., successful students. If only a few of the Ny Lilleskole children, instead of most of them, did well in their later schooling, many parents would stop sending their children there. Even the teachers, who are now fairly confident of the tightness of what they are doing, might begin to have doubts.

I have described the Ny Lilleskole in order to show some of the ways in which children and adults might live and work together, relate to each other, and learn from each other, in a place free of manipulation, bribe, and threat — in short, in a society without Schools. I am not trying to make people think, “Let's all get busy and make all our Schools like the Ny Lilleskole”; that is not my point. In the first place, it is clear that a society that would allow all its Schools to become more or less like the Ny Lilleskole would not want Schools at all, and would

simply do away with them. Beyond that, though a society that had schools like the Ny Lilleskole for all children would be a very good and pleasant place for them to live and grow up, it would still fall short of what I would call ideal. Even for the Ny Lilleskole children, most of Denmark is out of bounds, off-limits. I don't want children to have to spend all their time in places specially prepared for children, with people specially trained to look after them, no matter how nice those places and people might be. Children need much more than that — a society which is open, accessible, visible to all its citizens, young and old, and in which every citizen, however young or old, has the right to play an active, serious, responsible, and useful part. To make such a society involves a great deal more than reforming Schools, or even doing away with them altogether.

Most of the schools in the U.S. that start out trying to work more or less like the Ny Lilleskole die out in a few years. Sometimes they are split by arguments about freedom. (It is worth noting here that the Ny Lilleskole was formed by some teachers and parents who broke away from another little school they thought was becoming too much like conventional schools, too worried about "outcomes.") Sometimes they are harassed out of existence by local government officials, who, in the U.S. at least, generally don't like schools like this, or anything else that has the smell of freedom about it. Most often they either die for lack of money, or give up their principles under pressure from the rich people whose support they must have to live.

Of the alternative schools I saw in the U.S., one I particularly liked, that had the same spirit and feeling as the Ny Lilleskole, was the Children's Community in Ann Arbor, an integrated school with about twenty-five young, mostly poor kids. It ran for a few years in the late 1960s, died for lack of money, and

has recently started up again. The first director of the school, Bill Ayers, wrote two pieces about it for *This Magazine Is About Schools*, later reprinted in the excellent *This Book Is about Schools* (ed. Satu Repo, Vintage paperback). He wrote in part: In every integrated school except ours the model for failure is everything that is ghetto or Negro culture. . . . What we try to do is allow these groups of (black and white) kids to learn from each other, to exchange things, throw things away, pick things up, without any kind of value judgment. . . . The point is that kids learn by testing reality and not by what someone has decided is the truth they are going to tell them. . . . We see learning as going on everywhere — unstructured and undefined.

He describes the trips they took, with all or some of the kids. They went to apple orchards to get apples. Once, as they were there, they saw a truck loading apples. They followed it to an A&P, where it dropped off a load of apples, a few of which they bought. Another time, they went to a 'slaughterhouse, watched them kill, cut up; and package the animals. Bill had a little trouble watching this, but not the kids. They went to two automobile plants. Some of the kids were impressed by the assembly line, so huge, all that stuff coming together to make a car. Others talked about the stink, the heat, the noise, the dirt. They often went to the airport, not just to see airplanes, but also because: It's so many people talking in foreign languages, escalators, movies, little displays they have all over, cards hung up on the ceiling. And it's big and it's got a big marble floor, and you can run across it and no one gives you much trouble.



5.3.3 *What if adults do not have a 'visible' skill*

When parents point out to me that their work is not as impressive in its

progress as, say, that of a boat builder, I use my own work as an example. While writing is less easy to understand than the work of a carpenter or farmer, it is not necessarily opaque or meaningless to a child.

Writing is a process that takes place in time. I begin with raw materials and scraps of notes, write rough drafts, correct them, change them, finally produce a smooth draft, turn this over to someone else for further editing, and let it go into galley or some kind of proof sheets and eventually find its way into the finished newspaper, magazine, or book. Even if what I write about might not make much sense to children, they will surely be interested in many of the things I actually do. At every stage of the process outlined above, parents who are writers might show their child what they have done and talk a little (as much as the child wants) about what they are going to do next, and why. In the end, they could show the child their articles when they finally appear in print. They might even keep all their notes and rough drafts for a particular article, and on a big piece of cardboard paste-up an exhibit showing everything from the first steps to the final product. This would also be an easy and interesting thing to do in schools; it would show students what none of them now know or could imagine— the amount of work that goes into serious writing.

It is this sense of process over time that children want and need to learn about, and much of this is visible in most kinds of work. Even if parents can't show children their actual workplace, they can show them similar places. For instance, for the child of a journalist, any small offset press would be fascinating: the noise, all those things going round and round, the paper flying out with stuff printed on it. A mystery! But children would see that a grown-up understands it and controls it, and thinks that maybe someday if they wanted, they could too. They would also learn that their parents did not think of them as too small and stupid to be included in a central part of their own lives.

5.4 TEACHING AS A NATURAL SCIENCE

5.4.1 *What does it mean to be a naturalist?*

Helping children explore and learn in the world is best seen as a branch

of natural science, like trying to raise exotic plants or little-known animals, or perhaps trying to establish communication with dolphins and whales. What is called for and needed is something that very few teachers (unlike great naturalists) have, which is the ability to observe very closely and accurately, with a great eye for detail, and to report very accurately what is seen. In the mid-nineteenth century, the zoologist Louis Agassiz began a college course by putting a fish on a plate and asking his students to describe it. Every time they thought they had said all there was to say, and brought their papers up to him, he only said, "What else?" He did not let them stop looking at and writing about that fish until they had seen in it a hundred times more than they would have guessed there was to be seen it is this ability to see, and then describe accurately what was seen, that is the hallmark of the great naturalists, and a necessity for good teaching.

5.4.2 Why parents are more 'naturalist' towards children as compared to teachers?

While such close, patient observation is rare in most teachers, it comes more easily to parents, because of their interest in and love for their children. Like a naturalist, an observant parent will be alert both to small clues and to large patterns of behavior. By noticing these, a parent can often offer appropriate suggestions and experiences, and also, learn whether the help and explanations already given have been adequate.

5.4.3 When do children display or hide their feelings?

Children have their own styles of learning, every one unique. They also have their own timetables, according to which they are ready to do things, speeds at which they want to do them, and time they want to wait before doing a new thing. When we try to direct or interfere with, or change these learning styles and timetables, we almost always slow or stop them. It is much easier to see this in young children because the things they are learning are so visible - simple skills, names of letters, new words. If Billy has been asking us the names of letters when he sees them and, because we start quizzing him suddenly stops, we can see that he has stopped. In

young children changes of behavior are large and obvious. Also, they have not learned and do not try to conceal their acts and thoughts, and feelings (these are actually all one, experienced as one by children and all healthy people of any age). Older children may learn to hide from us, trick us. Because of fear, even first graders become adept at concealment and learn evasive strategies. When I wrote How Children Fail, it was only after months of observing and keeping careful notes that I was able to see underlying patterns of self-defeating behavior that the fifth-graders in my class had learned to conceal.

5.4.4 Be naturalists with kids

In trying to help small children, adults –whether nursery-school teachers, parents, or friends of these children— might look to the great natural scientists who have followed in Louis Agassiz's footsteps: Konrad Lorenz, Niko Tinbergen, Jane Goodall, or E. O. Wilson. Or they might look to the children themselves. "Science," of course, is not the private property of "scientists," but something that we all do when we are trying to solve some kind of problem or puzzle. Children, as I mentioned earlier, are acting like scientists all the time, which is to say looking, noticing, wondering, theorizing testing their theories, and changing them as often as they have to.

5.5 WHOSE RIGHT HAND?

Many parents struggle with this aspect that their children are unable to differentiate between right and left sides. Sometimes they do the things that are supposed to be done with right hands from their left hands (and vice versa). The author has provided the root causes of such issues and explained a couple of very useful suggestions that can be easily implemented at home and in schools. Several innovations can also be brought in this regard to make them more interesting for children.

5.5.1 Why do some children get confused about right and left hand

In making a mental model of the world, among the labels a small child must learn are "right" and "left." Most children learn them easily. They would hardly be worth mentioning, except for the fact that schools get very upset and anxious about them. As I wrote in *Teach Your Own*, if a child writes a letter backward, or reads off some letters in the wrong order, or does anything else to suggest he is confused about right and left, adults begin to talk excitedly about "mixed dominance" and "perceptual handicaps" and "learning disabilities." Specialists are called in and told to take over.

Once in an early elementary classroom, I needed something on my desk and asked a child if he would get it for me. He said OK and asked where it was. I said, "In the top right-hand drawer." There was a pause. Then he said. "Whose right hand, mine or the desk's?"

For a second, I was baffled. What on earth could he mean? Then I saw and understood. When he looked at the desk it was as if he saw a living creature facing him. So I said. "Your right hand." Off he went, brought back what I had asked for, and that was that.

Later it occurred to me that many young children must be animists and see objects as if they were living creatures. I wondered how many of them might have had that same question in their minds, without ever getting ahead and asking about it. How did they ever learn the answer? I decided after a while that one way or another they learned it from experience. They went to the desk, looked in its right-hand drawer, found nothing, looked in their right-hand drawer found what they wanted, and so learned which was meant. I realized that these children used the same approach as a toddler whom I described in *How Children Learn*. While sitting at the dinner table, she asked people to pass her the salt, pepper, butter, and so on so that she could find out what those words meant.

But some children might not react that way. They might assume that the adult had made a mistake about the drawer. Or they might think that they themselves had made a mistake about which was right and which was left. The kind of children who worry about mistakes (because their

parents or teacher worry) might be particularly ready to blame them for any confusion.

5.5.2 What are children thinking when they are confused about this

Most children master the confusion of right and left because they never actually become aware of it, any more than I do until recently. Others may become aware of the confusion but are not troubled by it and don't feel any need to set it right or make sense of it - it's just the way things are.

But some children are philosophers. They examine everything. They like things to make sense, and if they don't (which our right-left rules do not), to find out why not. Still, others are threatened and terrified. I suspect that most of the children who have persistent trouble with right and left in school or in life are of this latter kind. After a few right-left mistakes, which they make only because they have not yet learned our crazy right-left rules, they begin to think, "I must be stupid. I never can figure out right and left." Soon they go into a blind panic every time the words come up. They work out complicated strategies of bluff and avoidance.

When people ask about right and left, they learn to get other clues, "You mean the one over there by the window?"

5.5.3 How could such children be helped?

One thing we should not do, which the schools are very likely to do if they ever buy this theory of mine, is to set out to teach the "rules" of right and left, as they now teach the "rules of phonics," or colors or shapes or sounds as if no one ever learned anything unless it was taught. I can just see workbooks with lists of things that have their own right hands, and things that do not, with daily tests for the children, and so on.

Most children have always figured out right and left without much teaching other than being told when very little, "This is your right hand; this is your left." Let them go on learning that way. But if a child seems to be confused or anxious about this, then we can be more explicit. We can say, "I mean your right hand, not the desk's," or "I mean the coat's right

hand, not yours," perhaps adding "I know that sounds a little crazy, but that's just the way we do it; don't worry about it, you'll get used to it."

In my mind's eye, I can also see a little right-left reminder-a little rug, or piece of heavy cloth, or wood, or even cardboard, with an outline of the child's two bare feet, side by side, the right foot marked R and the left L. When the child stands on it, with his feet pointed the same way, he can then tell which is which.

5.6 CORRECTING MISTAKES

5.6.1 *Why should mistakes not always be 'corrected'*

When children first learn to talk, they will often use the name of one object to refer to a whole class of similar objects. In *How Children Learn*, I told of a child who called all animals in fields "cows," even horses and sheep. There are a number of important reasons why I feel strongly that not correcting such "mistakes" is the proper thing to do.

(1) Courtesy: If a distinguished person from a foreign country were visiting you, you would not correct every mistake he made in English, however much he might want to learn the language because it would be rude. We do not think of rudeness or courtesy as being applicable to our dealings with very little children. But they are.

(2) The child who first isolates a class of objects and labels them has performed a considerable intellectual feat. Our first reaction to any such feat should be one of acceptance and recognition. Without making a great to-do about it, we should by our actions make clear to the child that he has accomplished something good, not that he has made a mistake. Put yourself in his position. If you were just learning, in a foreign country, to speak a foreign language, how would you feel if everyone around you corrected every error you made? Unless you are a most exceptional person, the effect of this would be to make you so careful that you would wind up saying little or nothing— like a man I know who after six or seven winters in Mexico, cannot speak twenty words of Spanish because he can't bring himself to say anything unless he is sure he is right.

(3) Some would say, "We do not help if we do nothing or say nothing to facilitate Learning." But that is the point. Just by our using the language ourselves, we give the child all the help she needs. Because other people called some of these animals "horses" or "sheep" instead of "cows," this little child learned, and very quickly, that this is what they were called. In short, we do not need to "teach" or "correct" in order to help a child learn.

(4) It is always, without exception, better for a child to figure out something on his own than to be told — provided, of course, as in the matter of running across the street, that his life is not endangered in the Learning.

As Muslims, in addition to physical safety, spiritual safety is also of great importance — in fact, it is more important than physical safety.

But in matters intellectual, I admit no exception to this rule. In the first place, what he figures out, he remembers better. In the second place, and far more important, every time he figures something out, he gains confidence in his ability to figure things out.

(5) We are fooling ourselves if we think that by being nice about it, we can prevent corrections from sounding like reproofs. It is only in exceptional circumstances and with the greatest tact that you can correct an adult without to some degree hurting his or her feelings. How can we suppose that children, whose sense of identity or ego or self-esteem is so much weaker, can accept correction equably? I would say that in ninety-nine cases out of a hundred, any child will take correction as a kind of reproof and this no matter how enthusiastic, pleasant, relaxed, or stimulating we may happen to be. I am ready to be about as dogmatic about this as about anything I know of; I have seen it too often with my own eyes.

(6) It is true, in a way, and misleading in a way, to say that children want to learn. Yes, they do, but in the way that they want to breathe.

Though I mostly agree with the above account, I think not letting the children know about the mistakes might be a risky idea in some cases. We do see examples in the sunnah where the mistakes are corrected (including those of children too - e.g. when a young companion joined the Prophet ﷺ while he was already in prayer, the child stood on the left side; the prophet ﷺ moved him to the right and showed him the correct position). I therefore tend to think that some mistakes should be pointed out to children but in a loving manner and in a way that they should not feel bad or disrespected in the process. When we do so, they should get a feeling that this is someone who is my own and who loves me unconditionally; I can rely on him. The manner should also be such that the kids becomes interested to know more about the thing being pointed out rather than being discouraged to leave the idea at all.

5.6.2 Learning for children as like how they breath (and not 'conscious' exercise)

Learning, no more than breathing, is not an act of volition for young children. They do not think. "Now I am going to learn this or that." It is in their nature to look about them, to take the world in with their senses, and to make sense of it, without knowing at all how they do it or even that they are doing it.

In *What Do I Do Monday*, John Holt writes:

"By now it may be somewhat easier to see and feel what I mean in saying that we can best understand learning as growth, an expanding of ourselves into the world around us. We can also see that there is no difference between living and learning, that living is learning, that it is impossible, and misleading, and harmful to think of them as being separate. We say to children, "You come to school to learn." We say to each other, "Our job in school is to teach children how to learn." But the children have been learning, all the

time, for all of their lives before they meet us. What is more, they are very likely to be much better at learning than most of us who plan to teach them how to do it. Every time I do something new, go somewhere new, meet someone new, have any kind of new experience, I am expanding the world I know".

One of the greatest mistakes we make with children is to make them self-conscious about their learning so that they begin to ask themselves, "Am I learning or not?" The truth is that anyone who is really living, exposing himself or herself to life and meeting it with energy and enthusiasm, is at the same time learning. It is worrying about learning that turns off children's learning. When they begin to see the world as a place of danger, from which they must shut themselves off and protect themselves, when they begin to live less freely and fully, that is when their learning dies down.

Even when children reach the age when they are, some of the time, self-consciously and deliberately learning something that they want to learn, it does not follow that they always want to be told. A healthy child will almost always rather figure something out for herself. A veteran teacher not long ago summed it up beautifully. "A word to the wise," he said, "is infuriating."

5.7 PRAISE JUNKIES

5.7.1 *Lack of self-confidence behind over-praising*

There has been much written about how important it is to encourage children's self-concept by giving them lots of praise. To me, this advice is a serious mistake. I feel strongly about this issue because my first elementary-school teaching was at a school that believed in supporting children with lots of praise. By the time I came to know them in fifth grade, all but a few of the children were so totally dependent on continued adult approval that they were terrified of not getting it, terrified of making mistakes. The practice of that school – and since then I have seen many others like it – had exactly the opposite results from those intended. Every teacher in that school was intent upon nurturing each child's self-

esteem, but despite their intentions, their stream of praise had an extremely destructive effect on most of the children. Though affluent, high-I.Q., and favored in all possible ways, they were pathetically lacking in self-confidence.

Since then, I have seen a great many adults working with children, in school and other settings, and I would say that something like 99 percent of the praise I have observed was more harmful than helpful. I think of countless teenagers I have known who hated themselves despite having been praised all their lives. They say, "People just praised me to get me to do what they wanted." Many children are both cynical about praise and dependent on it, the worst possible mixture.

5.7.2 The problem with external motivational factors

The trouble with any kind of external motivation, whether it be negative (threats or punishments or scolding) or positive (gold stars, M&M's, grades, Ph.D.'s or Phi Beta Kappa keys), is that it displaces or sub-merges internal motivation. Babies do not learn in order to please us, but because it's their instinct and nature to want to find out about the world. If we praise them for everything they do, after a while they are going to start learning, doing things, just to please us, and the next step is that they are going to become worried about not pleasing us. They're going to become just as afraid of doing the wrong thing, as they might have been if they had been faced with the threat of punishment.

Though I agree with the above account, I believe some appreciation is necessary. Such appreciation should be for an actual and genuine performance when a kid has strived hard on something and made an effort. It should not be artificial. Kids can easily differentiate between what is genuine and what is not. Also, it should not be based on results alone. This is one of the major problems in our society that we are too much focused on results as opposed to effort or alternate abilities that the kids are blessed with. Academic progress is not the only sign of a child's intelligence. Many children are not so good at 'academics' but are

exceptional at other skills.

The world without genuine appreciation will be a very painful one to live in, at least in my humble opinion. Especially those with an artistic mindset are inclined to get motivated by appreciation. We all need this positive environment to go on. However, we should not become dependant on it; if dependency comes in, a lot of diseases of hearts (such as arrogance, duality in personality, and so on) will start reigning our hearts.

5.7.3 What should we provide instead? Thoughtful attention!

What children want and need from us is thoughtful attention. They want us to notice them and pay some kind of attention to what they do, to take them seriously, to trust and respect them as human beings. They want courtesy and politeness, but they don't need much praise.

Many parents choose home-schooling over conventional schooling for this reason. I fully agree with the idea that children need thoughtful attention. I also fully understand and appreciate that parents are best positioned to fulfill this need of children and many conventional schools are doing a terrible job at this. However, one benefit that I see in schools is that children can interact with other children for longer periods. They can find common interests and enjoy each other's company. This can help them establish their interpersonal skills. I am therefore inclined towards the idea that homeschooling options where other kids can join too for some time might be better for children than homeschooling in which kids are left with just their parents. There is a need for a relation (*ta'aluq*) with others and that is one of the five fundamental needs of relatedness for children. We should try to provide them with an opportunity to do so. My intention (may Allah swt fulfill it) is to start a school on a model similar to Lille Ny Skole where kids not only fulfill their need for socialization but also learn from being in the company of experts. Parents can

volunteer at the school and be a part of the process. This, to me, seems like a solution that might work well for many.

At this point, I would also like to highlight that I do see benefits and advantages in the idea of homeschooling on one hand but also have some fears from it on the other. The types of parenting we do at the moment can be very risky for children, especially when they are stuck with us all the time under home-schooling. We first need to improve as parents and then do homeschooling. Also, I think many of the important concepts discussed in this book are not known to many parents. They need to learn them (and other useful insights about the correct method of home-schooling) first and then think of homeschooling (in my humble opinion). If this is not done, home-schooling can become even more dangerous for children than conventional schooling.

5.8 UNWANTED HELP

5.8.1 The rubber-band solution and the upset child:

Something happened a while ago in the office that showed me, once again, how intense and yet how fragile little children's sense of pride and dignity is, and how careful we must be not to trample on it, most of all when we mean well.

A mother came into the office with her eighteen-month-old daughter. While the mother looked over our books to see what she wanted to buy, the little one explored the office. Finally, the mother had the four books she wanted, which the little girl asked to carry. But one of the books kept slipping out from between the others and falling to the ground, and this began to frustrate and irritate the child. Seeing that she clearly did not like having the book fall on the floor, I thought I might help by putting a rubber band around them. I got a rubber band, stretched it a couple of times to show the little girl what it was, and put it around the books. She looked at it a second, saw that it was indeed holding the books together, and then burst into furious tears.

From many years of being with little children, I had a sense of what the matter was. She saw my putting the rubber band around the books as a comment, which indeed it was, on the fact that she could not hold them together, and she was offended. To her, it was as if I had said, "You're so clumsy that you'll never be able to carry those books unless I put this rubber band on." Quite naturally, this made her ashamed and angry.

Since I understood what the trouble was, I was able to set things right.

I said, "I'm sorry, I'll take that rubber band off," and did so. Instantly she stopped crying and was as happy as she had been before - not too happy, as a matter of fact, because she was getting hungry and was beginning to hiss a little about getting something to eat.

Thinking this over, I don't feel that I necessarily made a mistake in vying to help with the rubber band. It didn't bother me that she kept dropping the book but I could see that it bothered her. Under other circumstances, perhaps in a place where she felt more at home, or at a time when she was not hungry and a little irritable, or even if she had known me a little better, she might have been willing and happy to accept the rubber-band solution to the book problem, might even have become interested in the rubber band, experimented with it, and played games with it.

But as it was, hungry, a little ill, and at a strange place when a strange (if friendly) man exasperated by the trouble she had been having with the books offered help, she took the offer of help as an insult. No harm was done; I quickly withdrew and canceled my "help," and, seeing her feelings and wishes understood and respected. She instantly forgave me and went on with life as before. What would have made the situation worse, and might have brought on a real crying fit - a "tantrum", as the detestable word goes - would have been my vying to Ignore and override her feelings and her protest, insisting on solving the problem my way, perhaps even getting a little angry at her for rejecting my well-meant "help".

5.8.2 A mother and her children with the puzzle

A letter I received from the mother of four young sons made the dangers of well-meaning but uninvited help dramatically clear. She had bought a large jigsaw puzzle for her boys, a map of the world, which came accompanied by a teacher's manual. As a dutiful parent, she had read the manual and had taken note of the teaching methods suggested. Her insightful letter continued as follows:

Sometime later, Kale (six at the time) got the puzzle out and was putting South America together on the floor. Jared (almost thirteen), who was very much into World War II, came over, picked up Germany and Japan, and said, "Man, Cam, look at this! These two little countries fought almost the whole rest of those countries and nearly won." Then Cam (eleven) asked Kale if he could put together Asia and the communist countries. And Jared started re-enacting WWII battles. At this point, Mommy remembered the manual and jumped in with distance comparisons, etc. Jared walked on to his bedroom. A few minutes later, Cam headed for the kitchen, and shortly after, Kale went outside to play, AND THERE SAT MOMMY PUTTING TOGETHER THE PUZZLE BY HERSELF!

Poor well-meaning Mommy! The happy ending is that she learned something from this, or she wouldn't have written to tell us about it. And it's fair to guess that sometime later they all got back to the puzzle.

5.8.3 How would children act or react in such situations when under compulsion

This story illustrates a very important point. Thousands of parents teaching their own children have learned from experience, just as this mother did, that interfering very much in the play and learning of children often stops it altogether. Parents learn this lesson easily. Why is it so hard to learn for people who teach in schools? The answer is simple. The reason that this mother could see right away that her meddling had, for the time being at least, spoiled the map game for everyone, was that her children were free to leave the room. Suppose they hadn't been; suppose it had been a regular classroom, and the children had been compelled not only to stay there but to go on doing the assigned work

with the map. What would have happened is that they would have begun to do as little as they could get away with. Instead, they might have daydreamed, or bluffed, or played the old classroom game of "I don't get it," or bugged the teacher by putting the map together wrongly. But to the teacher, all these file activities would have looked as if the children were still working on the map, and so the vital lesson would have been lost.

5.83 Seek the signs to understand the situation and feelings

With any captive audience, there is a lack of feedback. If you're running a restaurant, and put fish on the menu, you learn very quickly whether or not your customers like fish. If you're running an army mess (or school lunch cafeteria) where everyone has to take the fish whether they like it or not, you don't find out - unless like good mess cooks you pay attention to the garbage and happen to notice that there's a lot of fish in there.

Observant parents can pay attention both to the leftovers and to second helpings. Even if they make mistakes at first, they have the opportunity to become effective teachers, because they get from their children the kind of feedback that tells them when their teaching is helpful and amen it is not.

5.9 A FINE LINE

5.9.1 How to identify if you are 'responsive' or 'intrusive':

When I talk with parents about the dangers of unwanted help, they will often ask how to tell the difference between being responsive and being intrusive. I usually suggest that they let their children tell them the difference. Since the children won't do it with words, probably, this means being alert to their signals.

5.9.2 Reading and responding to signals from children

The most difficult challenge is not to have hurt feelings when they send a "*leave me alone, let me do it*" signal. If children send such signal, parents needn't apologize or make a big thing of it; they can just say, "sure" and go on about their business.

On the whole, if we don't punish children for the messages they send us, or make them feel guilty about sending us such messages, they can be relied on to send as many messages as are needed. If we don't hear their first message, they will send a second. There's no need to get complicated or anxious about this; kids are good communicators.

5.9.3 How do home get turned into "schools"

Perhaps a finer line must be drawn when a parent answers a child's question and tries to extend the child's understanding by adding new information. Beyond a certain point, there can be danger here. If everything we say or do around a child has some kind of conscious pedagogical intent, if our response to everything children do is to think, "How can I use this to teach them something?" we run the risk of turning our home into a school. There doesn't have to be, and shouldn't be, a lesson in everything.

The line is hard to hard, harder yet to describe. I like my friends to tell me things that they are interested in and that I don't know — it is a part of any good conversation. Yet I don't like being around people who act and talk as if their mission in life were to educate me, whose relation to me is always that of a teacher to pupil. When your children are little enough, almost anything you say is fascinating. But as they get a little older they will become very aware of how you talk to your adult friends, and they will not like it if you have one way of talking to friends and another, different, more teacherish way of talking to them.

5.9.4 Signals which tell you that you are on the right track

When playing with children, it is very easy to slip from suggesting a new activity that might be fun and that children might not have thought of by themselves, to manipulating or directing their play. If the child says, "Hey, that's neat!" or, better still, "Mom, remember that thing you showed me with the blocks! Let's try it again," Mom is on the right track.

5.9.5 Aspects to be careful about

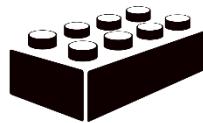
There's nothing wrong with offering a suggestion, but there are several things you have to be careful about. First of all, both parent and child must know that it is a suggestion, which the child is free to refuse. If the child directly refuses to go along with it, or goes along with it but obviously without enthusiasm, it is best to let the matter drop, and quickly. Don't coax, and don't keep on with the activity on the theory that if the child does it long enough he will eventually get to like it. Adults can learn to take "no" for an answer.

If parents look hurt or disappointed when their suggestions are not eagerly welcomed, after a while the child will begin to think, "When Dad or Mom suggests something, I'd better do it, or otherwise they'll feel bad." Using these feelings, or the fear of these feelings, to get children to do what we want is much worse than giving plain old-fashioned commands. If parents themselves can't stop from being hurt when their suggestions are turned down, it is better for them to stop making them.

Even if children do go along with suggestions for games, it's better not to make too many of them. If we're always thinking up neat things for the kids to do, they won't have enough time to think up a thing of their own. Beyond that, they may get the idea that all good ideas come from adults, and so become dependent on us. It's nice to entertain children some of the time, but it wouldn't make any sense to get ourselves out of the full-time teaching business only to put ourselves into the full-time entertainment business. We have things of our own to do. So, even with good ideas, moderation is important.

CHAPTER

6. THE NATURE OF LEARNING



Chapter Summary:

John begins this chapter by explaining three metaphors that explain the misery of the current school system:

- Children are considered as bottles in a bottling plant that move on a conveyor line and get filled by different forms of substances (like maths, English, Urdu, and so on) as considered appropriate by the 'decision-makers'. The bottles that do not comply with their process are considered defective. The assumption is that whatever is shoved in will be retained by children. What is forgotten here is that children are not like bottles!
- The children are treated as mice in lab experiments through the negative and positive re-enforcements in schools. If a rat clicks a particular shape while in the cage, the reward comes out. If it hits the other shape, it receives an electrical shock. This is what we do to our children and limit their possibilities. They do what is linked to reward and are not allowed to follow their natural creativity and curiosity.
- Schools act as a mental hospital. If children are unable to learn what is being taught, they are labeled with different types of disorders. The fact that these problems occur due to stress is completely ignored.

After explaining the incorrect views about education, John explains how children really learn. Several observations are shared in this regard. My key learnings from the rest of the chapter are as follows:

- Children like to find answers to their questions. If they have got a question or paradox in mind, an answer to the question or solution to the paradox will be pulled in like a magnet it becomes available. This learning would sustain.
- Children learn from everything. They are not dependant on a particular learning setting (such as a school). The adults should allow them to have as many experiences as possible and allow their natural creativity, and curiosity to grow.
- Children ask questions to gain understanding. They do not just ask about some petty things but also about some fundamental philosophical questions such as 'why does the world exist'. In an effort to 'cover content', these questions should not be killed. Questions are a significant component of learning. Children ask them to find the missing pieces of the puzzle. If the answer, in adequate depth (not too much), is provided, it would stay with them.
- Feelings of children vary. Adults should respect them and attune themselves accordingly.
- Children learn the most when they do something out of passion. They should be allowed to pursue their good passions.
- We learn from our life experiences. So do children. There is learning in finding contradictory pieces of information, going to good or bad places, meeting interesting or not-so-interesting people, and so on. Children should also be provided experiences. Purposeful traveling can be a very

good option in this regard. Meeting people along with children can also boost their thinking, raise questions in their minds and help them grow.

Helping children explore and learn in the world is best seen as a branch of natural science, like trying to raise exotic plants or little-known animals.

6.1 THREE MISLEADING METAPHORS

More than we may realize, what we do in our lives and our work is greatly influenced by metaphors - the pictures we have in our minds about how the world works or ought to work. Often these images are more real to us than reality itself.

Organized education is governed and dominated by three particular metaphors. Some educators are more or less aware that their work is guided by these metaphors, others are not aware at all, and still others might vigorously deny their influence. But conscious or not, these metaphors have largely determined and still determine what most teachers do in school.

6.1.1 *The first metaphor (inability to differentiate between 'teaching' and 'learning')*

The first of these metaphors presents education as an *assembly line* in a bottling plant or canning factory. Down the conveyor belts come rows of empty containers of sundry shapes and sizes. Besides the belts is an array of pouring and squirting devices, controlled by employees of the factory. As the containers go by, these workers squirt various amounts of different substances - reading spelling, math, history, and science — into the containers. Upstairs, management decides when the containers should be put on the belt, how long they should be left on, what kinds of materials should be poured or squirted into them, at what times, and what should be done about containers whose openings (like pop bottles) seem to be smaller than the others, or seem to have no openings at all.

When I discuss this metaphor with teachers, many laugh and seem to find it absurd. But we need only to read the latest rash of school-improvement proposals to see how dominant this metaphor is. In effect, those official reports all say, we must have *so many years* of English, so many years of math, so many years of foreign language, so many years of science. In other words, we must squirt English into these containers for four years, math for two or three, and so on.

The *assumption* is that whatever is squirted at the container will go into the container and, once in, will stay in. No one seems to ask the obvious question: How come so many of the containers, having had these substances squirted at them for so many years, are still going out of the factory empty? In the face of a century of contrary experience, **educators cling to the notion that teaching produces learning, and therefore, the more taught, the more learned.** Not one of the reports I have read has raised serious questions about this assumption. If students don't know enough, we insist, it is because we didn't start squirting soon enough (start them at four), or didn't squirt the right stuff or enough of it (toughen up the curriculum).

6.1.2 *The second metaphor (the nature of reward system in schools)*

A second metaphor depicts students in a school as laboratory rats in a cage, being trained to do some kind of trick – most often *a trick that no rat in real life would ever have any reason to perform*. Here sits the rat and at the other end of the cage is a circular shape and a triangular shape. If the rat presses the "light" shape – the one the experimenter wants him to press – out comes a tasty morsel. If the rat presses the "wrong" shape, the unwanted one, he gets an electric shock.

According to John Goodlad of the School of Education at the University of California in Los Angeles, this is what almost all teaching in schools was at the turn of the century, and it is still what teaching is today – task, morsel, shock. For morsel and shock, read carrot and stick, or "positive reinforcement" and "negative reinforcement."

The positive reinforcements in schools are teachers' smiles, gold stars, A's on report cards, dean's lists, and, at the end, entrance into prestigious colleges, good jobs, interesting work money, and success. The negative reinforcements are angry scolding, sarcasm, contempt, humiliation, shame, the derisive laughter of other children, the threats of failure, of being held back, of flunking out of school. For many poor children, the negative reinforcements include physical beatings. At the end of this line is an entrance into low-rank colleges or none at all; bad jobs or none at all, dull work if any, not much money, or outright poverty.

6.1.3 The third metaphor (blame-shifting by schools)

The third metaphor is, perhaps, the most destructive and dangerous of all. It describes the school as a mental hospital, a treatment institution. Schools, top-rank or Low-rank, have always operated under the wonderfully convenient rule that when learning takes place, the school deserves the credit ("*If You Can Read, Thank a Teacher*"); and that when it doesn't, the students get the blame. The blame used to be parcelled out in plain English. At a highly rated private elementary school, a veteran teacher put it this way, "*If the children don't learn what we teach, its because they are lazy, disorganized, or mentally disturbed,*" and all but a few of his colleagues agreed.

More recently, however, educators have found another explanation for lack of learning: "*Learning disabilities.*" This explanation became popular because it had something for almost everyone. Guilt-ridden middle-class parents of failing students could stop asking. "What did we do wrong!" The experts told them, "You didn't do anything wrong; your child's just got some wires crossed in his head." Angry people demanding that schools "get busy and teach my kid something" could be told, "I'm sorry, there's nothing we can do; he's learning disabled."

Children as young as five or six, often in their first days at school, are now routinely given batteries of tests "to find out what is wrong with them." Some children are even told by their teachers that this is what the tests are for. A substantial pan of the pseudo-science of pedagogy is now made up

of listing and describing these diseases, the tests that are supposed to diagnose them, and the activities designed to treat but hardly ever designed to cure.

The "research" behind these labels is biased and not very persuasive. Some years ago, at a large conference of specialists in learning disability, I asked whether anyone had ever heard of — not done, but merely heard of — any research linking so-called perceptual handicaps with stress. In the audience of about 1,100, two hands were raised. One man told me then, the other told me later, about research that showed that when students with supposedly severe learning disabilities were put in a relatively stress-free situation, their disabilities soon vanished.

Our third metaphor, like the first two, presents a false picture of reality. The schools *assume* that children are not interested in learning and are not much good at it, that they will not learn unless made to, that they cannot learn unless shown how, and that the way to make them learn is to divide up the prescribed material into a sequence of tiny tasks to be mastered one at a time, each with its appropriate morsel and shock. And when this method doesn't work, the schools assume there is something wrong with the children — something they must try to diagnose and treat.

All these assumptions are wrong. If you start from Chicago to go to Boston, and you think that Boston is due west of Chicago, the farther you go, the worse off you will be. If your assumptions are wrong, your actions will be wrong, and the harder you try, the worse off you will be.

6.1.4 How kids really learn

The easily observable fact is that children are passionately eager to make as much sense as they can of the world around them, are extremely good at it, and do it as scientists do, by creating knowledge out of the experience. Children observe, wonder, find, or make and then test the answers to the questions they ask themselves. When they are not actually prevented from doing these things, they continue to do them and to get better and better at it.

6.2 LEARNING IS MAKING SENSE OF THINGS

6.2.1 *Children like to solve paradoxes*

Children are much more able than we think when one thing they've said, or that somebody has said, isn't quite consistent with another. In other words, they want the parts of their mental model to fit. If the parts don't fit, they're disturbed. They are, in a sense, philosophers; they like to resolve contradictions. They're made uneasy by paradox. They like to have things make sense. But they have to do this in their own way and in their own time.

Until a child becomes really dissatisfied with his own mental model, until he feels it isn't right, corrections don't make sense. They roll right on his back. Corrections that he makes, or at least is in the mood to listen to, are the corrections that he needs.

6.2.2 *Magnets in childrens' brains*

The reason why teaching in the conventional sense of the word — telling children things — is almost inherently impossible, is that we cannot know what the state of a young child's mind is. He hasn't got words to tell us.

All of us know more than we can say — and I don't just mean more than we have time to say — more than we can put into words. But this is one hundred times more true of a child: he has a great many more understandings that he *cannot possibly verbalize*, and a great many misunderstandings.

In his mental model of the world, there are a great many gaps that he might sense, but he is not able to put these into words. **A child just feels a gap in his mind, like a missing piece in a jigsaw puzzle. But when through his experiences, one way or another, along comes the piece of information that fits that gap, it's pulled in there as if by a magnet.** I think we've all experienced this.

There's some little gap in our knowledge or understanding, and, all of a sudden, perhaps in a book, perhaps out of some experience, there comes

an idea and it fits. You practically feel it rush into the hole and you plug it uptight. You don't forget things like that. These are the sorts of things kids learn. They can't tell us what these things are. They have no way of telling.

6.2.3 Another metaphor – but a valid one! (curiosity is to be nurtured)

If a child is left alone with a pile of books or material, 95 percent of what she reads goes into her head — and right out again. But when she is doing this on her own, what happens is like what happens in one of these chemical plants that get magnesium out of seawater. Billions of gallons go pouring through this great conversion plant. They don't get much magnesium out of a gallon of seawater, but an enormous number of gallons go through. This, I think, is true of children.

When a child is learning on his own, following his own curiosity, an enormous amount of stuff is going through the plant. From this, he is picking out subconsciously the sniff he needs. What we do when we try to decide everything for him is to slow down the process without increasing the efficiency. *We think we're making it more efficient – but we're really not we're just cutting down the intake.*

6.2.4 What does 'efficiency' in learning mean?

What is efficient? How does a small child learn a language? She absorbs with her ears an enormous amount of verbal information — if she is living in a family where she hears a lot of talk and where people talk to her. Most of it she doesn't remember or doesn't even understand. But she picks out a bit here, a bit there. She picks out the things she wants and needs. We say, "Ha, this is inefficient. When we get her in school, we're going to show her the efficient way to study a language." We have grammar, our tenses, vocabulary lists. But which is more efficient? Who learns languages better?

6.2.5 Treatment for different types of students in school

One of my objections to school is that the kind of child who, for reasons

of personal integrity – really wants to do what we're telling him, really wants to learn and not just pass an exam – gets into endless trouble because he is the kind of student who is always asking questions. The teacher thinks, "I've got all this material to cover. I don't want to go into the whys and wherefores¹⁴." This kind of student, being something of a philosopher, will be very conscious of contradictions and paradoxes because life is full of them. Maybe the best minds in the field are vying to resolve his conflicts. Poor Miss Jones isn't going to be able to resolve them, and she doesn't want to be headed by them. This kind of kid gets little help in school. He's in hot water. He learns very quickly that nobody is interested in having him understand how these things really work.

6.2.6 Some observations about those who are quick learners and those who are not

Over the years I have noticed that the child who learns quickly is adventurous. She's ready to run risks. She approaches life with arms outspread. She wants to take it all in. She still has the desire of the very young child to make sense out of things. She's not concerned with concealing her ignorance or protecting herself. She's ready to expose herself to disappointment and defeat. She has a certain confidence. She expects to make sense out of things sooner or later. She has a kind of trust.

On the other hand, to the less successful student, the world is not only a somewhat senseless place, it's tricky. It's her enemy to some extent. She doesn't know what is going to happen, but she has a pretty good hunch it's going to be bad. She is not trusting.

The successful student is resourceful and he is also patient. He'll try something one-way, and if he doesn't get it, OK, he'll try it this way, and if that doesn't work, he'll try it another. But the unsuccessful student has neither the resourcefulness to think of many ways nor the patience to hang on.

The good student, possibly because he's not so worried possibly because

¹⁴ 'Wherefore' refers to 'asking the reason or purpose of something'

he has this style of thinking, is able to look objectively at his own work— to stand back from it and to look for inconsistency and to see mistakes. This can't be right if this is right so, let's see what's wrong here.

6.2.7 Parents and teachers should understand the feelings of children

Adults have to be conscious of a rise and fall in children— like the rise and fall of die tide— of courage and confidence. Some days kids have a tiger in their tank. They're just raring to go; they're full of enthusiasm and confidence. If you knock them down, they bounce up. Other days, you scratch them and they pour out blood. What you can get them to try, and what you can get them to tolerate in the way of correction or advice, depends enormously on how they feel, on how big their store of confidence and self-respect happens to be at the moment. This may vary - it may vary even within the space of an hour.

If you don't punish a child when she isn't feeling brave, pretty soon she will feel brave. That is, if you don't outrun her store of courage, she will get braver.

6.2.8 Passion makes children grow like trees

A child only pours herself into a little funnel or into a little box when she's afraid of the world — when she's been defeated. But when a child is doing something she's passionately interested in, she grows like a tree - in all directions. This is how children learn, how children grow. They send down a taproot like a tree in dry soil. The tree may be stunted, but it sends out these roots, and suddenly one of these little taproots goes down and strikes a source of water. And the whole tree grows.

6.2.9 Do not let the philosopher in children die

One of the things you find in listening to the conversations of children is that the questions that little kids ask themselves about the world are likely to be very big questions, not little ones. They don't ask, "Why does the water come out of the tap?" Instead, they ask, "Where did the universe come from?" Children are not only philosophers; they are cosmologists,

they're inventors of myths, of religions - literally like the Indians who came up with the idea that there was a turtle and the world grew out of his back, or that the gods brought fire.

We tend to be patronizing or to take a precious view of children's fantasies and stories. "That's a lovely story, Jimmy but of course you know it isn't true." But this is a child engaged in very serious work. He's not just diverting himself – he's trying to make a model of the universe, really on a much bigger scale than you or I ever think on anymore. He's asking himself questions about time and life and God and creation. These are philosophers at work. We should give them time to think.'

6.3 LIVING AS LEARNING

6.3.1 *We learn all the time*

Not long ago I heard a college president refer to himself as a "womb-to-tomb": that is, a person who would like us all to be learners all our lives. What he actually meant, of course, was that he would like us to be students at some educational institution, with or without walls, all our lives. He meant that he would like us to be responsible to some expert or body of experts for what we know, that we would for all our lives be in the position of having to prove every so often that we were shaping up, knowing a satisfactory amount of what these experts felt we ought to know. Horrifying as I found this statement, it made me think that in a properly understood sense we are already learners all our lives. Living is learning. It is impossible to be alive and conscious (and some would say unconscious) without constantly learning things.

If we are alive we are receiving various sorts of messages from our environment all the time. We take these in, in one form or another, and make use of them. We are constantly experiencing reality and in one-way or another incorporating it into our mental model of the universe: the organized sum of what we think we know about everything.

6.3.2 *Learning from experiences contradictory to our mental model:*

Many people, in order to protect the integrity of their rather simple mental model, in order to save themselves the pain of having to rethink what they thought they understood, react to any experiences that do not conform with what they think they already know, do not fit neatly into the already existing mental model, by rejecting these experiences. Yet even this is to add something to the mental model.

Let us imagine that two people read in a newspaper or magazine an article that gravely shakes up or contradicts their notions of how things really are. One of these people confronts this new experience squarely, does not reject it, tries to fit it into his model, or rather readjust his model to take account of it - always a slow and painful experience and one I'm always in the middle of. The other person, in an approach we often call narrow-minded may just reject that piece of information altogether. But he does not leave the experience where he came in. He must somehow or other account for the fact of its having been in the newspaper. So he makes up a theory that somebody was lying in the paper, or, more probably that the paper is lying to him, perhaps that it is run by Communists or perverts or something. Maybe he adds a couple of more names to his list of people or publications that he will not believe. In the same way, we learn something from any and all kinds of experiences in our lives.

6.3.3 Learning from traveling:

If we live in or go to a city, and see all kinds of beautiful buildings, fascinating places and activities, we learn from what we see. We learn that cities can be interesting and perhaps we get some ideas about what we might do to make other cities more livable and interesting. If, on the other hand, we go to a city and are frightened or bored or disgusted with what we see, we may learn nothing pleasant, but we do learn not only that the city is bad but also that probably most cities are. Perhaps, we learn, like many people to hate cities in general.

6.3.4 Learning from meeting people:

If we met an interesting new person we learn a great deal about that

person and his or her life and interests. He or she throws light on many parts of the world that we did not know about, and we may incorporate some of them into our model and feel an urge to explore still further. If the person is not interesting, we may not learn anything else from him or her, but we at least learnt that he or she is not interesting and we may generalize from that to think that most people are not very interesting or that it is a good idea to stay away from parties or whatever it was where we met this not interesting person.

6.3.5 Learning from the work we do

In the same way, we learn - something from the work we do, however interesting or dull, good or bad, it might be. It is not possible to be alive and conscious without learning something.

6.4 EVERY WAKING HOUR

6.4.1 Natural desire in children to understand things

Among the many things I have learned about children learned by many many years of hanging out with them, watching carefully what they do, and thinking about it, is that children are **natural learners**.

The one thing we can be sure of or surest of is that children have a passionate desire to understand as much of the world as they can, even what they cannot see and touch, and as far as possible to acquire some kind of skill, competence, and control in it and over it. Now this desire, this need to understand the world and be able to do things in it, the things the big people do is so strong that we could properly call it biological. It is every bit as strong as the need for food, for warmth, for shelter, for comfort, for sleep, for love. In fact, I think a strong case could be made that it might be stronger than any of these.

A hungry child, even a tiny baby who experiences hunger as real pain, will stop eating or nursing or drinking if something interesting happens, because that little child wants to see what it is. This curiosity, this desire to make some kind of sense out of things, goes right to the heart of the

kind of creatures that we are.

6.4.2 Learning is not the product of teaching

Children are not only extremely good at learning; they are much better at it than we are. As a teacher, it took me a long time to find this out. I was an ingenious and resourceful teacher, clever about thinking up lesson plans and demonstrations and motivating devices and all of that acamaracus¹⁵. And I only very slowly and painfully, believe me, learned that when I started teaching less, the children started learning more.

I can sum up in five to seven words what I eventually learned as a teacher. The seven-word version is: **Learning is not the product of teaching**. The five-word version is: Teaching does not make learning. As I mentioned before, organized education operates on the assumption that children learn only when and only what and only because we teach them. This is not true. It is very close to one hundred percent false.

6.4.3 How is learning created

Learners make learning. **Learners create learning**. The reason that this has been forgotten is that the activity of learning has been made into a product called "education," Just as the activity, the discipline, of caring for one's health has become the product of "medical cure," and the activity of inquiring into the world has become the product of "science," a specialized thing presumably done only by people with billions of dollars of complicated apparatus. But health is not a product, and science is something you and I do every day of our lives. In fact, the word science is synonymous with the word learning.

What do we do when we make learning, when we create learning?

Well, we observe, we look, we listen. We touch, taste, smell, manipulate, and sometimes measure or calculate. And then we wonder, we say, "Well,

¹⁵ This word, also spelt as ackamarackus, refers to: A meaningless activity engaged in just for show; deceptive nonsense.

why this?" or "Why is it this way?" or "Did this thing make this thing happen?" or "What made this thing happen?" or "Can we make it happen differently or better?" or "Can we get the Mexican bean beetle off the beans?" or "Can we raise more fruit?" or "Can we fix the washing machine?" or whatever it might be. And then we invent theories, what scientists call hypotheses; we make hunches, we say, "Well, maybe it's because of this," or "Perhaps it's because of that," or "Maybe if I do this, this will happen." And then we test these theories or these hypotheses.

We may test them simply by asking questions of people we think know more than we do, or we may test them by further observation. We may say, "Well, I don't quite know what that thing is, but maybe if I watch it longer I will find out." Or maybe we do some kind of planned experiment - 'Well, I'll try putting this on the beans and see if it does something to the bean beetles,' or "I'll try doing something else." And from these, in various ways, we either find out that our hunch was not so good, or perhaps that it was fairly good, and then we go on, we observe some more, we speculate some more. We ask more questions, we make more theories, and we test them.

This process creates learning, and we all do it. It's not just done by people at M.I.T. or Rensselaer Polytechnic. We do it. And this is exactly what children do. They are hard at work at this process all their waking hours. When they're not actually eating and sleeping, they're creating knowledge. They are observing, thinking, speculating, theorizing, testing, and experimenting – all the time – and they're much better at it than we are.

6.4.4 They already know it!

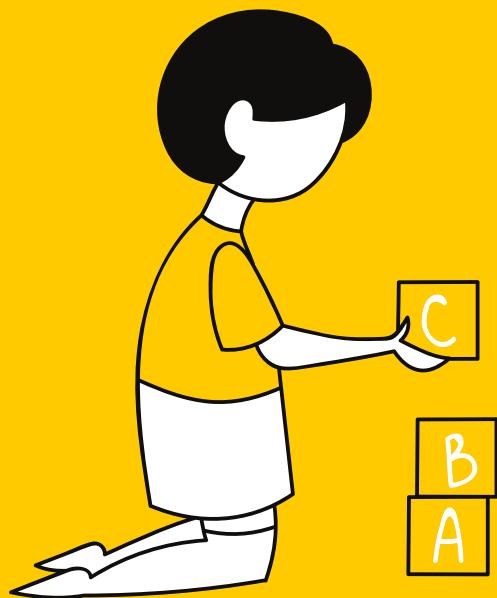
The idea, the very idea that we can teach small children how to learn has come to me to seem utterly absurd. As I was writing this, there came, as if by a wonderful coincidence, a long letter from a parent. At one point she says something that is so good that it could be a title for this book: "Every Time I Think of Something to Teach Them, They Already Know It."

6.4.5 Children learn from everything

Children learn from anything and everything they see. They learn wherever they are, not just in special learning places. They learn much more from things, natural or made, that are real and significant in the world in their own right and not just made in order to help children learn, in other words, they are more interested in the objects and tools that we use in our regular lives than in almost any special learning materials made for them.

6.4.6 How can parents and teachers help children learn

We can best help children learn, not by deciding what we think they should learn and thinking of ingenious ways to teach them, but by making the world, as far as we can, accessible to them, paying serious attention to what they do, answering their questions - if they have any - and helping them explore the things they are most interested in. The ways we can do this are simple and easily understood by parents and other people who like children and will take the trouble to pay some attention to what they do and think about what it may mean. In short, what we need to know to help children learn is not obscure, technical, or complicated, and the materials we can use to help them lie ready at hand all around us.



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